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RCRA FACILITY INVESTIGATION
SUMMARY REPORT
FORMER DIGITAL EQUIPMENT
CORPORATION FACILITY
SAN GERMAN, PUERTO RICO
DIGITAL PROJECT NO. 052-03018

PREPARED FOR:
Digital Equipment Corporation
Maynard, Massachusetts

PREPARED BY:
GZA GeoEnvironmental, Inc.
Portland, Maine

July 1995
File 20876.8

Digital Equipment Corporation
111 Powdermill Road
Maynard, Massachusetts 01754

August 11, 1995

Sr. Santos Cabrera
Environmental Quality Board of Puerto Rico (EQB)
Land Pollution Control Area
Office of the Board: National Bank Plaza
431 Ponce deLeon Avenue, 11th Floor
Hato Rey, Puerto Rico 00917

Re: Design Submittal - Voluntary Interim Measures
RCRA Facility Investigation Summary Report
Soil and Groundwater Remediation Project
Former Digital Equipment Corporation Facility
San German, Puerto Rico
Digital Project No. 052-03018

Dear Sr. Cabrera:

Digital Equipment Corporation is pleased to submit the enclosed Remedial Systems Design Report (Design Report) and RCRA Facility Investigation (RFI) Summary Report for our former facility in San German, Puerto Rico. This Design Report is submitted in accordance with the Interim Measures Proposal[1] submitted to the EQB on December 20, 1994 and includes the engineering design for construction and operation of both the soil vapor extraction system and the groundwater containment and treatment systems at the site. The RFI Summary Report presents a summary of site conditions based on the previous investigations conducted at the site.

In order to proceed with the project in an expeditious manner and in keeping with the project schedule presented in the Overall Project Plan (OPP)[2], the Design Report will be the only engineering design submittal for this project. Future permitting, construction, and operation of the remedial measures will proceed in general accordance with the OPP schedule. We intend to startup the remedial systems by the end of September 1995.

As stated in my July 26, 1995 correspondence, we would like to meet with you and Sr. Concepcion on August 17, 1995 at 10:00 am to discuss our proposed remedial system designs.

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[1]GZA, December 20, 1995, Interim Measures Proposal, Soil and Groundwater Remediation, Former Digital Equipment Corporation Facility, San German, Puerto Rico, Digital Project No. 0522-03018.

[2]GZA, November 11, 1994, Overall Project Plan, Voluntary Interim Measure, Former Digital Equipment Corporation Facility, San German, Puerto Rico;

This meeting would also serve as a quarterly project status meeting in accordance with the schedule proposed in the OPP. Please contact me at tel. (508)493-8746 or my assistant Ms. Judy Sherman at tel. (508)493-8270 to confirm this date.

Please feel free to call me should you have any questions. I thank you for your continued interest in our project and I look forward to working with you to complete this work.

Yours truly,

DIGITAL EQUIPMENT CORPORATION

John A. A. Zannos
Manager - Acquisitions, Divestiture, and Remediation
Environmental Health and Safety

JAAZ/GZA/mp

cc. Sr. Herman Concepcion, EQB
Sr. Pedro Jose Rivera, PRIDCO
Mr. Rene Robitaille, Circo Craft
Mr. Jean Robert Jean, U.S. EPA Region II
Cindy Lewis, Esq., Digital
Mr. John Paquin, GZA
Sr. Miguel Nazaro

GZA
GeoEnvironmental, Inc.

Integrated Environmental Services

July 31, 1995
File 20876.8

Mr. John A. A. Zannos
Manager, Acquisition, Divestiture, and Remedial Projects
Digital Equipment Corporation
111 Powdermill Road, MSO2-3/G22
Maynard, Massachusetts 01754

Re: RCRA Facility Investigation Summary Report
Former Digital Equipment Corporation - SGO
San German, Puerto Rico
Digital Project No. 052-03018

4 Free Street
Portland, Maine
04101
207-879-9190
FAX 207-879-0099

Dear John:

GZA GeoEnvironmental, Inc. (GZA) is pleased to provide you with the enclosed RCRA Facility Investigation (RFI) Summary Report. As we discussed, this report presents a summary of "topics" recommended by the Environmental Protection Agency (EPA) to be included in an RFI work plan.[1] It is not intended to be a formal RFI report; rather, as stated in Section 1.00 of the report, we suggest that this report, together with certain past reports prepared for the site in aggregate, should be considered equivalent to an RFI.

W hope that this work product is consistent with your expectations and needs; however, please do not hesitate to contact either of the undersigned if you have any questions or comments.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

John R. Paquin
Project Manager

A Subsidiary of GZA GeoEnvironmental Technologies, Inc.

Matthew J. Barvenik
Managing/Project Principal

JRP:mp

Enclosure: RFI Summary Report

[1]EPA, May 1989, Interim Final, RCRA Facility Investigation (RFI) Guidance, Vol. I of IV, Development of an RFI Work Plan and General Considerations for RCRA Facility Investigations.

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EXECUTIVE SUMMARY

This report presents a summary of site conditions at the former Digital Equipment Corporation (Digital) facility in San German Puerto Rico (site). This document, in conjunction with certain other reports previously prepared for the site,[1] are intended to satisfy the requirements of a RCRA Facility Investigation (RFI).

The site consists of about 18 acres of land owned by the Puerto Rico Industrial Development Corporation (PRIDCO) on which there are three industrial buildings totaling about 200,000 square feet. The site was previously occupied by Digital and operated as a printed wire board (PWB) manufacturing facility. In 1992, site operations were transferred to the Circo Caribe Corporation (Circo), which has continued PWB manufacturing processes at the site. On-site process water is obtained from pumping several on-site water supply wells installed in bedrock.

The site is located approximately 1,200 feet west of the Guanajibo River. The site and vicinity have been filled and graded during site development in 1968. The general stratigraphy of subsurface materials at the site consists of silt and clay fill overlying silty clay topsoil, overlying saprolite (soil derived from in-place weathering of bedrock), overlying fractured basalt bedrock.

Under non-pumping conditions, groundwater is expected to flow northwest toward the Guanajibo River. The results of pump-tests of an on-site production well demonstrate a consistent hydraulic response in bedrock and saprolite, indicating a significant degree of interconnection of the bedrock and overburden. Groundwater flow conditions are affected by on-site groundwater withdrawals. Current groundwater withdrawals are estimated to be over seven times the estimated groundwater recharge for the area contributing to groundwater flow through the site.

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[1]The past reports for this site include:

- GZA, December 20, 1994, Interim Measures Proposal, Soil and Groundwater Remediation, Former Digital Equipment Corporation Facility, San German, Puerto Rico, Digital Project No. 05203018;
- GZA, November 11, 1994, Overall Project Plan, Voluntary Interim Measure, Former Digital Equipment Corporation Facility, San German, Puerto Rico;
- GZA, December 20, 1993, Report of Findings, Phase II, Hydrogeologic Evaluation, Former Digital Equipment Corporation Facility, San German, Puerto Rico; and
- GZA, October 22, 1992, Hydrogeologic Evaluation, Digital Equipment Corporation, San German Operation, San German, Puerto Rico.

While localized petroleum hydrocarbons were detected in the vicinity of a former diesel underground storage tank (UST), the most significant subsurface contamination issue at the site is the presence of chlorinated ethenes. These compounds were detected in the groundwater on a site-wide level. Chlorinated ethenes were also detected in the vadose zone soils at a loading dock between buildings 1 and 5 indicating that the loading dock is a source area.

Sampling and analysis of surface water and sediment from the Guanajibo River did not detect any contaminants attributable to the site. Published information which indicates that water quality in the river has historically been poor due to sewage discharges.

Based on the groundwater elevation and hydrologic data, the current practice of groundwater extraction from wells W-1, W-6, and W-7 for process water use appears to contain the contaminants on-site. This conclusion is further supported by the volume of water extracted which is over seven times the recharge for the portion of the drainage berm expected to contribute to groundwater flow through the site. Given on-site containment, there are effectively no complete migration pathways which would result in impact to off-site receptors. Therefore, impacts to the river should not be occurring, as supported by both sediment and surface water data. On-site exposures due to dermal contact, incidental ingestion and inhalation of on-site contaminants contained in soil, groundwater, and process water appear limited. If the groundwater extraction is terminated in the future due to facility shutdown, it is expected that site groundwater will flow to the river, but with no significant impact. In addition, the two unregistered private wells which may exist at the El Convento Housing District 300 feet to the south of the site (based on an unsubstantiated verbal report), appear to be cross-gradient under non-pumping conditions. While a high degree of pumpage from these private wells, with the facility process works shut down, potentially could result in some contaminant impact, such pumping would be illegal. Not withstanding the above, more formal institutional controls may warrant consideration if the facility was shut down.

GZA believes that the past studies conducted at the site are consistent with requirements of the RCRA CA process. We suggest that this report as well as certain past reports, in aggregate, be considered at the equivalent of an RFI. In accordance with the Overall Project Plan and the Interim Measures Proposal (IMP), previously submitted to the EQB, Digital is proceeding to remedy soil and groundwater contamination by chlorinated ethenes as a voluntary Interim Measure following the requirements of the RCRA Corrective Action process. As presented in the IMP, the objectives of the proposed remedy are to:

- Treat and contain volatile organic compound-(VOC)containing groundwater; and
- Remediate VOC-containing vadose zone soils in the Loading Dock area, the only confirmed source at the site to reduce introduction of VOCs to the groundwater.

1.00 INTRODUCTION

This report presents a summary of site conditions at the former Digital Equipment Corporation (Digital) facility in San German Puerto Rico (site). A site locus plan is provided as Figure 1. This report was prepared by GZA GeoEnvironmental, Inc. (GZA) to summarize relevant site conditions to assist the Environmental Quality Board of Puerto Rico (EQB) in its review of on-going investigation and remediation work of the site being completed following the format of the National Corrective Action Strategy under the Resource Conservation and Recovery Act (RCRA).[2] This report was prepared based on the information presented in several previous reports for the site, including:

- GZA, December 20, 1994, Interim Measures Proposal, Soil and Groundwater Remediation, Former Digital Equipment Corporation Facility, San German, Puerto Rico, Digital Project No. 05203018 (herein referred to as the IMP);
- GZA, November 11, 1994, Overall Project Plan, Voluntary Interim Measure, Former Digital Equipment Corporation Facility, San German, Puerto Rico (herein referred to as the OPP);
- GZA, December 20, 1993, Report of Findings, Phase II, Hydrogeologic Evaluation, Former Digital Equipment Corporation Facility, San German, Puerto Rico (herein referred to as the Phase II report); and
- GZA, October 22, 1992, Hydrogeologic Evaluation, Digital Equipment Corporation, San German Operation, San German, Puerto Rico (herein referred to as the Phase I report).

Each of the above referenced reports has been previously submitted to the EQB. The information presented below is intended to summarize and consolidate our overall understanding of general conditions pertaining to soil and groundwater contamination at the site. This report and the above referenced reports, in aggregate, are intended to satisfy the general requirements of a RCRA Facility Investigation (RFI) for the San German site. Please refer to the above referenced reports for more specific information concerning site conditions and field and laboratory methodologies. Please note that this report is subject to the limitations presented in Appendix B.

[2]Herein referred to as RCRA Corrective Action or RCRA CA.

2.00 FACILITY BACKGROUND

The site consists of about 18 acres of land on which there are three industrial buildings totaling about 200,000 square feet. Site features are shown on the site plan provided as Figure 2. As stated in the OPP, the site was utilized by Digital from July 1968 into 1992 for single- and multi-layer printed wire board (PWB) manufacturing and module assembly. In 1992 the site buildings and operations were transferred to the Circo Caribe Corporation (Circo) who has continued the PWB manufacturing processes at the site. The site real estate is owned by the Puerto Rico Industrial Development Corporation (PRIDCO).

The PWB manufacturing operations employ the use of acids, alkalines, metal-bearing plating solutions, and oxidizing/reducing chemicals. During the period between 1976 and 1978, trichloroethene (TCE) was used in the wave solder process as a degreaser. After 1978, an aqueous/detergent solution replaced TCE.

2.10 ON-SITE GROUNDWATER WITHDRAWALS

Circo is currently operating under a Puerto Rico Department of Natural Resources (PRDNR) Water Franchise Permit for groundwater withdrawal from on-site bedrock production wells of up to 49,920,000 gallons per year, or 192,000 gpd for a five-day work week. Bedrock wells W-1, W-3, W-6, and W-7 are routinely used to provide this industrial process water supply. The drawdown from these wells has been projected to extend across the site in both overburden and saprolite.

2.20 REGULATORY AND INVESTIGATIVE HISTORY

In October 1990, the EQB issued a RCRA Facility Assessment Report[3] (RFA) identifying eight on-site RCRA Solid Waste Management Units (SWMUs) and one on-site Area of Concern (AOC). Each of the EQB identified SWMUs and AOC are shown on Figure 2. The scope of RFA work was reported to include "a preliminary review" of EQB's files and visual-site inspections. A "preliminary visit" was conducted on August 2, 1989 with a "visual site inspection" on February 20, 1990. The RFA included a summary of background information, a detailed assessment of each identified SWMU and AOC, and provided a summary of conclusions and direction regarding future actions.

In July 1992, a first phase of facility investigation was initiated at the site (Phase I report). Consistent with the intent of a RCRA Facility Investigation, the stated purpose of this investigation was to "assess whether manufacturing operations" at the site "have impacted soil or groundwater quality" and to "provide a preliminary assessment of the horizontal

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[3]Puerto Rico Environmental Quality Board, October 1990, RCRA Facility Assessment Report, Digital Equipment Corporation, San Germán, Puerto Rico, PRD991291857, Adia T. Fuentes Rivera, EQB Land Pollution Control Area, Hazardous Waste Division.

and vertical extent of subsurface contamination encountered." The investigation included a review of available regulatory files and operations records; the performance of a soil gas survey; drilling of soil borings and installation of monitoring wells; and finally sampling and laboratory testing of soils and groundwater for volatile organic compounds (VOCs), metals[4], petroleum hydrocarbons, and cyanide.

GZA concluded that "the most significant subsurface contamination issue is the presence of chlorinated VOCs." Petroleum hydrocarbons were detected in groundwater and soil at the location of a former diesel fuel UST. The limited presence of metals including barium, nickel, and selenium in groundwater was attributed to naturally occurring conditions (barium and selenium) or the vicinity of a historical incidental process water release (nickel). The observed presence of metals was not considered significant in that either the metals were naturally occurring (barium and selenium) and/or were localized (at a central portion of the site) and at low concentrations (nickel). Recommendations were provided regarding additional explorations and testing "to develop the data necessary to design an appropriate remediation program" for chlorinated VOCs which would likely include: "mitigation of contaminant source areas" and "limiting off-site migration of contaminants by hydraulic isolation."

A copy of the Phase I report was transmitted to EQB in early November 1992. A "work plan" outlining the proposed next phase of work was provided on November 30, 1992. The work plan proposed a second phase of facility investigations, and corrective measures feasibility studies to assess applicable remedial options and technologies. As stated in the plan, the objectives were directed toward "better defining conditions observed in the" Phase I facility investigation, and "developing data required for remediation of groundwater and soil contamination." The seven specific information objectives identified in the Plan were focused on characterization of hydrogeologic and environmental quality conditions on a site-wide basis, and the primary contaminants of concern (chlorinated ethenes).

Initiation of field work for the second phase of facility investigation and corrective measures study was deferred until after January 1993 so that EQB would have time to review and comment on the proposed work plan. The field work began on February 1, 1993 and was completed in April 1993. The report summarizing our findings and recommendations resulting from the additional facility investigation work, and studies into the feasibility of corrective measures, was transmitted to the EQB on August 12, 1993 (Phase II Report). The report was accompanied by a separate letter report[5], providing a

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[4]Metals included RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) plus nickel.

[5]GZA GeoEnvironmental, Inc., August 9, 1993, Supplemental Report, Findings of Phase II Hydrogeologic Evaluation, Former Digital Equipment Corporation Facility, San Germán, Puerto Rico.

summary of the findings as related to the EQB October 1990 RFA. This letter report was prepared in response to a June 3, 1993 letter from EQB.[6]

The Phase II report included an assessment of contaminant sources, distribution, and transport; and an assessment of possible routes of human exposure. The corrective measures studies included a review of potential applicable remedial technologies for groundwater containment, and loading dock source area mitigation. Consistent with proposed RCRA CA Rules[7], potentially applicable technologies and remedies were identified and screened against factors such as protection of public health; long term reliability; reduction of toxicity, mobility and volume; short term effectiveness; and implementability.

As of this writing, Digital has not received EQB questions or comments on the Phase II report. In mid-July 1994, representatives of Digital met with all of the parties to discuss the on-going project. During meetings with the EQB, it was established that the remedial project would be undertaken consistent with the RCRA CA process with EQB review. On November 11, 1994, the Overall Project Plan (OPP) for this remedial project was submitted to the EQB. A proposal to perform a soil and groundwater remediation as a voluntary Interim Measure (IMP) was submitted to the EQB on December 20, 1994.

In February 1995, the EQB revised the RFA.[8] The revised RFA indicated that no further action required for six of the eight original SWMUs and the recommended actions at the remaining two original SWMU's were completed by the submittal of a RCRA Closure Report in February, 1995.[9]

The EQB also added the loading dock between Buildings 1 and 5 as SWMU-9 in the revised RFA. In a letter dated April 25, 1995, Digital suggested that based on EPA's definition of a SWMU, it may be more appropriate to consider the loading dock to be an Area of Concern (AOC). However, this distinction is a matter of procedure only, since regardless of the description of the loading dock as a SWMU or an AOC, Digital's approach remains to address the loading dock as part of a site-wide Corrective

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[6]June 3, 1993, Letter from Sr. Roberto Berberena, J.R., Director, EQB Land Pollution Control Area, to Angel Serrano, Digital Equipment Corp., San Germán, Puerto Rico.

[7]U.S. Environmental Protection Agency, 1990, Proposed Rule for Corrective Action for Solid Waste Management Units (SWMUs) at Hazardous Waste Management Facilities, pg 62 through 65 VI, Subpart F,(2) General Standards for Remedies, and Subpart F (3) Remedy Selection Decision Factors.

[8]Environmental Quality Board of Puerto Rico, February 15, 1995, RCRA Facility Assessment Report, Digital Equipment Corporation, San German, Puerto Rico, PRD991291857.

[9]GZA, February 23, 1995, RCRA Closure Report and Certification, Hazardous Waste Container Storage Areas, Former Digital Equipment Corporation Facility, San German, Puerto Rico.

Action Management Unit (CAMU). This CAMU approach is discussed further in the OPP and IMP.

In the RFA, the EQB stated that "Digital should continue their Corrective Action Plan as scheduled" and that the "IMP can be considered an RFI"; however, the EQB required Digital to submit a quality assurance/quality control (QA/QC) plan, and a receptor survey to complete the RFI. Digital suggested that a QA/QC plan and a receptor survey were already conducted and submitted to the EQB as part of the Phase II study.

3.00 SITE HYDROGEOLOGY

The site is located approximately 1,200 feet west of the Guanajibo River in a tributary drainage basin of about 54 acres in size, bounded by a steep northwest to southeast trending ridge to the north and a smaller hill to the south. Based on topography, the area of watershed which can be expected to contribute to groundwater flow through the site under ambient conditions is approximately 25 acres (Figure 1).

Hydrogeologic profiles of the site, showing GZA's interpretation of subsurface conditions, are included as Figures 3 and 4. As shown on Figure 5A, the center of the valley originally extended in a southeasterly direction through the site.

The site and vicinity have apparently been filled and graded during site development in 1968. Fill, consisting of clay and silt with lesser amounts of sand and gravel, has been encountered in thicknesses up to 23 feet in soil borings at the site. In a number of locations on-site, a silty clay topsoil layer has been encountered below the fill. The soils underlying the topsoil horizon were derived from natural chemical weathering of the underlying bedrock (saprolite). Bedrock observed in cores from the site, consists of altered mafic igneous rock (basalt). At the site, the depth to the water table ranges between about 15 feet to about 35 feet, placing the water table within the silt and clay fill and saprolite materials.

GZA's interpretation of ambient groundwater flow conditions are presented on Figure 5B, and the subsurface profiles shown on Figures 3 and 4.

Under non-pumping conditions, groundwater flow derived from precipitative recharge over the topographically highland areas to the north, east, and south of the site, converges towards the pre-development topographic valley, and then flows northwest toward the Guanajibo River. Groundwater flow conditions are affected by on-site groundwater withdrawals, as shown on Figures 5C and 5D.

Average annual precipitation in the lower Guanajibo River drainage basin is about 56 inches.[10] The EPA and the EQB reported a net precipitation (infiltration) of 14 inches per year for the site[11], which would imply on the order of 26,000 gallons per day of recharge contributing to groundwater flow through the site.

Leakage from subsurface water lines, and perhaps discharge of chiller condensate and roof drainage add to flow beneath the site and have resulted in a local groundwater mound approximately 4 feet above the general groundwater flow conditions in the saprolite.[12] Based on this recharge estimate, compared to Circo's current groundwater withdrawal rates and the pump testing results, it is likely that groundwater from the site is effectively contained by the on-going groundwater withdrawals.

The hydraulic properties of the soil and rock beneath the site have been measured through pump testing, slug tests, and empirically assessed via grain-size distribution data. Considering the data in aggregate, GZA estimated a range of bulk hydraulic conductivity for saprolite and rock of 0.1 to 1 feet per day (3×10^{-3} to 3×10^{-4} cm/sec). Apparent transmissivity values estimated from pumping tests range from approximately 100 ft^2/day to approximately 1,800 ft^2/day. The results of these tests further demonstrate a consistent response for bedrock and saprolite well couplets indicating a significant degree of interconnection of these units, presumably through remnant bedrock fabric (jointing).

Please refer to the Phase II report and the IMP for more detailed discussions pertaining to the site geologic and hydrologic settings.

4.00 NATURE AND EXTENT OF CONTAMINATION

As stated in the past reports, the primary contaminants of concern at the site are the presence of chlorinated ethenes in the soil and groundwater. As such, the following sections present discussions of the nature and extent of chlorinated ethenes in vadose zone soil and in groundwater at the site.

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[10]E. Colon-Dieppa and F. Quinones-Marquez, A Reconnaissance of the Water Resources of the Central Guanajibo River Valley, Puerto Rico, U.S. Geological Survey, Water Resources Investigations Report 82-4050, 1985.

[11]EQB, October, 1990, RCRA Facility Assessment Report, Digital Equipment Corporation, San German, Puerto Rico, PRD991291857, Adia T. Fuentes Rivera, EQB Land Pollution Control Area, Hazardous Waste Division.

[12]Leakages from subsurface water lines have been confirmed at the site. A leak from the sprinkler piping was repaired in January 1993, however there is evidence that additional leaks and other sources of water may be present.

4.10 SOIL

Potential sources and extent of chlorinated ethenes in vadose zone soil were assessed as part of the Phase II Hydrogeologic Evaluation by a combination of soil-gas survey and laboratory analysis of soil samples collected from soil borings. The results of the soil gas survey are shown on Figure 6. Soil samples collected above the water table from two soil borings performed in the vicinity of the loading dock (B-413 and B-414) contained concentrations of total chlorinated compounds as high as 919 milligrams per kilograms (mg/kg) confirming the vadose zone in this area as a source of on-going contamination to the groundwater. The facility-wide investigation did not reveal evidence to suggest that any of the eight areas identified as SWMUs in the RFA were sources of chlorinated ethene contamination.

4.20 GROUNDWATER

Site-wide groundwater sampling and laboratory analysis has been conducted on three occasions (sampling rounds): September 3 and 4, 1992 (Round I), February 19, 22, and 23, 1993 (Round II), and November 28, 29, and 30, 1994 (Round III). Analytical data from each sampling round are summarized in Table 1. A graphical comparison of these data is presented on Figure 7. As shown on Figure 7, the two primary compounds historically detected include trichloroethene, and one of its breakdown compounds, cis,1,2-dichloroethene. VOCs have been detected in groundwater samples from monitoring wells throughout the site, except for the northeastern portion of the site. Historically, concentrations are greatest for samples collected from monitoring wells screened within the saprolite, ranging from 16 to 41,000 micrograms/liter (ug/l). The highest concentration was detected during Round II in groundwater from a saprolite-screened well located near the northern property line (OW-304). As shown on Figure 7, in general, the concentration of total chlorinated compounds in samples collected from the bedrock wells is significantly lower than in the saprolite.

4.30 SURFACE WATER IN THE GUANAJIBO RIVER

Surface water and sediment samples were collected and analyzed from three up-stream to downstream locations along the Guanajibo River. VOCs and PHCs were not detected in any of the surface water or sediment samples. Analyses for metals in the three sediment samples showed concentrations below anticipated background levels based on testing of background samples collected from nearby borrow pits. Furthermore, there was no regular progression of increasing or decreasing metals concentrations in sediment samples with respect to sampling locations along the Guanajibo River (i.e., upriver or downriver). Metals were not detected in surface water samples in significant concentrations that could be attributable to the site.

As stated above, published information indicates that the general water quality of the Guanajibo River is poor due to sewage discharges[13]. According to this report, fecal total coliform concentrations of up to 670,000 colonies per 100 milliliters have been detected at a monitoring point in San German, up-stream of the site.

4.40 TEMPORAL VARIATIONS OF GROUNDWATER QUALITY

A temporal comparison of available groundwater quality data is shown on Figure 7. Graphs of water quality data versus time (time-series plots) for selected monitoring wells are included in Appendix B. Our ability to assess temporal trends in water quality is limited by the lack of data for wells found to be dry in 1994; however, in general, the data suggest:

- a substantial decrease in total VOC concentrations for samples from shallow wells screened in fill or natural topsoil (OW-106, and OW-305); and

- an apparent increase in concentrations for samples collected from deep bedrock wells (W-5, W-6, W-7, and BR-308).

Of particular note is the apparent presence of VOCs in samples from saprolite wells OW-301, and bedrock wells W-3 and W-4. Under ambient groundwater conditions, these wells are believed to be located across a groundwater divide from historical sources of on-site contamination. VOCs were not detected in these wells during sampling rounds I or II; however the presence of VOCs detected during sampling round III may be associated with Circo's increased use of W-3 for production pumping.

5.00 POTENTIAL RECEPTORS

The Phase II report included the results of a preliminary receptor survey and a qualitative public risk assessment.[14] A quantitative risk assessment was conducted as part of the Remedial System Design Report.[15] In assessing potential exposures, we considered:

- contaminant source mechanisms;
- contaminant transport mechanisms;

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[13]Colon-Dieppa, E., and F. Quinones-Marquez, 1985, op.cit.

[14]Presented as Appendix J and Table 9 of the Phase II report, respectively.

[15]GZA and Terra Vac, Inc., July 20, 1995, Remedial Systems Design Report, Interim Measure - Soil and Groundwater Remediation Project, Former Digital Equipment Corporation Facility, San German, Puerto Rico, Digital Project No. 052-03018.

- potential exposure points; and
- potential receptors.

A summary of potential human receptors is presented in Table 2. As shown in Table 2, potential receptors identified at the site include facility workers, utility workers, and local residents. On site facility workers may be exposed to chlorinated ethene vapors emanating from contaminated groundwater used as process water in the buildings. On-site utility workers may be exposed to chlorinated ethene-contaminated soil, vapors and shallow groundwater during future (hypothetical) subsurface utility repair or installation work.[16] Local residents may be exposed to contaminants migrating from the site through ingestion and dermal contact with contaminated groundwater from private water supply wells, ingestion and dermal contact with surface water from the Guanajibo River, and ingestion of fish caught from the Guanajibo River. Each of these potential exposures is further discussed below.

5.10 EXPOSURES AT THE GUANAJIBO RIVER

As stated in GZA's Phase II report, the available information did not indicate that measurable impacts to the Guanajibo River from contamination related to the site had occurred. Chlorinated VOCs and PHCs were not detected in surface water samples collected at two downstream locations in the River. Moveover, of ten metals analyzed in surface water and sediment samples collected from the river, only nickel was detected in downstream water samples, but at concentrations below enforceable health-based drinking water standards. GZA concluded that it was also unlikely that the site is the source of the nickel in the Guanajibo River given that nickel was not detected in significant concentrations in groundwater directly beneath the site.

Historical water resource data[17] indicate that in the past, water quality in the River has been generally poor due to sewage discharges. Data for a sampling point at the Highway 119 Bridge which is upstream of the site indicate elevated coliform, fecal coliform, and fecal streptococci as well as elevated concentrations of other parameters.

Direct human contact with surficial stream sediments is not considered to be a probable route of exposure as the sampling and analysis conducted to date has not shown significant levels of site derived target compounds in sediments in the Guanajibo River. Finally, the data from the Phase II report showed no trend in increasing contaminant levels moving from locations upstream of the site to downstream of the site. VOCs and PHCs were not detected in the sediment samples.

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[16]This exposure pathway may be limited to the loading dock source area.

[17] United States Geological Survey, 1985, A Reconnaissance of the Water Resources of the Central Guanajibo Valley, Puerto Rico, Water Resources Investigations Report 82-4050, San Juan, Puerto Rico.

Although the available evidence does not suggest that an impact to the Guanajibo River has occurred, based upon our understanding of the hydrology of the Guanajibo River, it is likely that, in the absence of groundwater containment at the site, the River represents the primary discharge point for groundwater migrating from the site; Therefore, it is possible that, in the absence of groundwater containment, aquatic organisms and recreational users of the River may be potential receptors of contaminants from the site. Due to poor historical water quality, it is expected that the Guanajibo River would not normally be used for human contact recreation of fish harvesting for consumption.

5.20 EXPOSURES VIA DRINKING WATER SUPPLIES

Based on the findings of our past studies, we have not identified any likely on-going receptors of chlorinated ethene contamination from the site. As stated in the Phase II, potential receptors of contaminated groundwater were assessed through performance of survey of public and private drinking water wells in the vicinity of the site. GZA identified data suggesting the presence of 23 public and private drinking water wells in the site area. Human exposure via public supplies is not considered likely for 21 of these wells, because the wells are located upstream of likely flow paths, and across the Guanajibo River from the site. As such these wells are believed to be hydrologically isolated from the site. The exposure pathway completion for the two remaining wells (located about 300 feet south of the site at the El Convento Housing District) was unknown, but thought unlikely, based on GZA's understanding of groundwater flow directions from the site.

The findings of GZA's water well research were subsequently independently confirmed by a study conducted by V. S. Rodriguez and Associates (VSR). The findings of the VSR study are presented in a report dated November 5, 1993 and are generally consistent with the findings of GZA's Phase II report. No additional records of registered, active, water supply wells between the site and the Guanajibo River were identified. Based on these findings, if any additional wells exist, it is likely that they are not operating under an approved PRDNR Water Franchise Permit and would be in violation of applicable Puerto Rico regulations.

The presence of a privately owned water supply well at the El Convento Housing District was further supported by the recollections of a local well driller. This well, however, has not been confirmed by site reconnaissance observations or a review of official records, including Water Franchise Permits. The lack of a Water Franchise Permit suggests that if the well exists and it is active pumped, it is not a legal installation/operation. Furthermore, based on our interpretation of groundwater flow conditions, if these wells exist, they are expected to be upgradient or sidegradient of likely groundwater flow paths from the site under site pumping conditions. An unconfirmed report indicates that a well at the facility (if any) may be used for filling and maintaining a swimming pool. If this report is correct, it is unlikely that the expected pumping rate would significantly affect groundwater flow conditions at the site.

5.30 ON-SITE EXPOSURES

The possibility of pathway completion for exposure of persons working at and visiting the facility via inhalation of VOCs is thought to be limited. Somewhat elevated VOC levels were detected in soil gas beneath the building floor slab in the waste treatment and finish good areas of Building 2, and the electrical test and solder mask areas of Building 1; however, the majority of the building is designed to operate at a net positive pressure relative to atmospheric. Therefore, air flow should be from the building interior, through any cracks in the floor slab, if they exist, and then into the subsurface. This advective transport of interior air should effectively block migration of VOCs from the subsurface to the building interior.

Similarly, under normal site operations, the possibility of pathway completion for exposure of persons working at and visiting the facility via contact with subsurface soils is thought to be limited. However, the possibility remains for human exposure in the event that on-site excavation occurs within areas of contaminated soils. Excavation might be necessary for installation and repair of utilities, or for expansion or alteration to site structures. Such exposures can be reduced through implementation of institutional controls for the site which require review of proposed excavation work, adherence to applicable Occupational Safety and Health Administration site safety standards during performance of such work, and documentation of conditions encountered.

6.00 IMPLEMENTATION OF VOLUNTARY INTERIM MEASURE

As stated above, Digital submitted the OPP and IMP to address soil and groundwater contamination by chlorinated ethenes identified during the Phase I and Phase II hydrogeologic investigations of the facility. This work will be conducted in general accordance with the RCRA Corrective Action format. As presented in the IMP and in previous documents, the objectives of the proposed project are to:

- Treat and contain VOC containing groundwater; and
- Remediate VOC-containing vadose zone soils in the only confirmed source at the site to reduce introduction of VOCs to the groundwater.

A groundwater containment and treatment system will be implemented utilizing the existing bedrock production wells. It is noted that based on our assessment of basin yield and the observed hydraulic responses of an existing production well, it is likely that the current and past groundwater withdrawals for production water has effectively functioned as an on-going containment system. VOC's in the pumped groundwater would be removed by activated carbon adsorption technologies and the treated water would be used as industrial process water by the current facility lessee. Operation of the groundwater

containment remedy would continue as long as the need for continued containment exists. Termination of active groundwater containment, in part or in whole, would occur if one or more of the following criteria are met:

1) Groundwater monitoring data indicate the quality of bulk groundwater flowing to the downgradient property boundary meets site-specific risk-based media protection standards;

2) The rate of VOC mass recovery becomes de minimis; or

3) The trend in VOC concentrations in groundwater reaches an asymptotic level.

Digital proposes to remove VOCs from the vadose zone soils in the loading dock area using soil vapor extraction. The system will operate until VOC concentrations in soil are below site-specific risk-based cleanup standards, or proposed RCRA Subpart S Action Levels, or until VOC concentrations reach an asymptotic condition.

Implementation of the Interim Measures began immediately following submission of the IMP. As shown on the schedule presented in the design report, construction of the remedial systems is expected to begin by early September 1995 and systems are expected to be started up by the end of the same month. Digital will keep EQB and EPA apprised of the performance of these systems by regular quarterly meetings and status reports.

7.00 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The site consists of about 18 acres of land owned by the Puerto Rico Industrial Development Corporation (PRIDCO) on which there are three industrial buildings totaling about 200,000 square feet. The site was previously occupied by Digital and operated as a printed wire board (PWB) manufacturing facility. In 1992, site operations were transferred to the Circo Caribe Corporation (Circo), which has continued PWB manufacturing processes at the site. On-site process water is obtained from pumping several on-site water supply wells installed in bedrock.

The site is located approximately 1,200 feet west of the Guanajibo River. The site and vicinity have been filled and graded during site development in 1968. The general stratigraphy of subsurface materials at the site consists of silt and clay fill overlying silty clay topsoil, overlying saprolite (soil derived from in-place weathering of bedrock), overlying fractured basalt bedrock.

Under non-pumping conditions, groundwater is expected to flow northwest toward the Guanajibo River. The results of pump-tests of an on-site production well demonstrate a consistent hydraulic response in bedrock and saprolite, indicating a significant degree of

interconnection of the bedrock and overburden. Groundwater flow conditions are affected by on-site groundwater withdrawals. Current groundwater withdrawals are estimated to be over seven times the estimated groundwater recharge for the area contributing to groundwater flow through the site.

The most significant subsurface contamination issue at the site is the presence of chlorinated ethenes. Petroleum hydrocarbons were detected in groundwater and soil at the location of a former diesel fuel UST. The presence of limited amounts of metals were attributed to naturally occurring conditions or the vicinity of a historical incidental process water release. Chlorinated ethenes in groundwater were detected on a site-wide level. Chlorinated ethenes were also detected in the vadose zone soils at a loading dock between buildings 1 and 2 indicating that this area is a source of on-going contamination to the groundwater.

Sampling and analysis of surface water and sediment from the Guanajibo River did not indicate an impact to the river attributable to the site. Published information indicates that water quality in the river has historically been poor due to sewage discharges.

Based on the groundwater elevation and hydrologic data, the current practice of groundwater extraction from wells W-1, W-6, and W-7 for process water use appears to contain the contaminants on-site. This conclusion is further supported by the volume of water extracted which is over seven times the recharge for the portion of the drainage berm expected to contribute to groundwater flow through the site. Given on-site containment, there are effectively no complete migration pathways which would result in impact to off-site receptors. Therefore, impacts to the river should not be occurring, as supported by both sediment and surface water data. On-site exposures due to dermal contact, incidental ingestion and inhalation of on-site contaminants contained in soil, groundwater, and process water appear limited. If the groundwater extraction is terminated in the future due to facility shutdown, it is expected that site groundwater will flow to the river, but with no significant impact. In addition, the two unregistered private wells which may exist at the El Convento Housing District 300 feet to the south of the site (based on an unsubstantiated verbal report), appear to be cross-gradient under non-pumping conditions. While a high degree of pumpage from these private wells, with the facility process works shut down, potentially could result in some contaminant impact, such pumping would be illegal. Not withstanding the above, more formal institutional controls may warrant consideration if the facility was shut down.

GZA believes that the past studies conducted at the site are consistent with requirements of the RCRA CA process. We suggest that this report as well as certain past reports, in aggregate, be considered at the equivalent of an RFI. In accordance with the Overall Project Plan and the Interim Measures Proposal (IMP), previously submitted to the EQB, Digital is proceeding to remedy soil and groundwater contamination by chlorinated ethenes

as a voluntary Interim Measure following the requirements of the RCRA Corrective Action process. As presented in the IMP, the objectives of the proposed remedy are to:

- Treat and contain volatile organic compound-(VOC)containing groundwater; and
- Remediate VOC-containing vadose zone soils in the Loading Dock area, the only confirmed source at the site to reduce introduction of VOCs to the groundwater.

TABLES

TABLE 1

SUMMARY OF GROUNDWATER TESTING

Digital Equipment Corporation
San German, Puerto Rico
mg/l

Sample ID:	W-1				W-3						W-4				W-5	
Date:	1992		1993		1992		1993		1994		1993		1994		1992	
	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL
Volatile Organic Compounds																
Chloroform	0.006		0.003		ND	0.002	ND	0.002	0.128		ND	0.002	ND	0.005	0.12	
1,1-Dichloroethane (DCA)	ND	0.002	ND	0.002	ND	0.002	ND	0.002	0.07		ND	0.002	ND	0.005	ND	0.002
1,2-Dichloroethane	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.005	ND	0.002
1,1-Dichloroethene	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.005	ND	0.002
cis-1,2-Dichloroethene (DCE)	0.008		0.005		ND	0.002	ND	0.002	ND	0.005	ND	0.002	0.019		ND	0.002
trans-1,2-Dichloroethene	ND		ND	0.002	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.005	ND	0.002
Methylene chloride	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.005	0.007	
Tetrachloroethene (PCE)	ND	0.002	0.002		ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.005	ND	0.002
Toluene	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005	ND	0.001	ND	0.005	ND	0.001
1,1,1-Trichloroethane (TCA)	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.005	ND	0.002
Trichloroethene (TCE)	0.022		0.012		ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.005	0.003	
Vinyl chloride	ND	0.005	ND	0.01	ND	0.005	ND	0.002	ND	0.005	ND	0.002	ND	0.005	ND	0.005
Metals																
Iron									0.078				0.118			
Manganese									ND	0.05			ND	0.05		
Barium	0.12		0.12		0.27		0.34				0.14				0.15	
Nickel	ND	0.01	ND	0.01	ND	0.01	ND	0.01			ND	0.01			ND	0.01
Selenium	ND	0.01	ND	0.01	ND	0.01	ND	0.01			ND	0.01			ND	0.01
PHCs			ND	0.001												

TABLE 1

SUMMARY OF GROUNDWATER TESTING

Digital Equipment Corporation
San German, Puerto Rico
mg/l

Sample ID:	W-5						W-6						W-7			
Date:	1992-DUP		1993		1994		1992		1993		1994		1992		1993	
	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL
Volatile Organic Compounds																
Chloroform	0.12		0.028		0.203		ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002
1,1-Dichloroethane (DCA)	ND	0.002	ND	0.002	ND	0.005	0.002		ND	0.002	ND	0.005	ND	0.002	ND	0.002
1,2-Dichloroethane	ND	0.002	ND	0.002	0.052		ND	0.002	ND	0.002	0.34		ND	0.002	ND	0.002
1,1-Dichloroethene	ND	0.002	ND	0.002	ND	0.005	0.005		0.004		ND	0.005	ND	0.002	ND	0.002
cis-1,2-Dichloroethene (DCE)	ND	0.002	ND	0.002	0.015		0.077		0.084		0.013		0.004		0.011	
trans-1,2-Dichloroethene	ND	0.002	ND	0.002	ND	0.005	0.007		0.006		ND	0.005	ND	0.002	ND	0.002
Methylene chloride	0.008		0.002		ND	0.005	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002
Tetrachloroethene (PCE)	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002
Toluene	ND	0.001	ND	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.005	ND	0.001	ND	0.001
1,1,1-Trichloroethane (TCA)	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002
Trichloroethene (TCE)	0.003		ND	0.002	ND	0.005	0.16		0.15		0.042		0.01		0.029	
Vinyl chloride	ND	0.005	ND	0.01	ND	0.005	ND	0.005	ND	0.01	ND	0.005	ND	0.005	ND	0.01
Metals																
Iron					0.947						0.239					
Manganese					ND	0.05					ND	0.05				
Barium	0.17		0.17				0.1		0.1				0.2		0.27	
Nickel	ND	0.01	ND	0.01			ND	0.01	ND	0.01			ND	0.01	ND	0.01
Selenium	ND	0.01	ND	0.01			ND	0.01	ND	0.01			ND	0.01	ND	0.01
PHCs			ND	0.001												

TABLE 1

SUMMARY OF GROUNDWATER TESTING

Digital Equipment Corporation
San German, Puerto Rico
mg/l

Sample ID:	W-7		OW-1		OW-2				OW-101		OW-102			
Date:	1994		1993		1992		1993		1994		1992		1993	
	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL
Volatile Organic Compounds														
Chloroform	ND	0.005	ND	0.002	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002
1,1-Dichloroethane (DCA)	ND	0.005	ND	0.002	0.003		0.004		ND	0.005	0.01		0.008	
1,2-Dichloroethane	ND	0.005	ND	0.002	ND	0.002	ND	0.002	0.34		ND	0.002	ND	0.002
1,1-Dichloroethene	ND	0.005	ND	0.002	0.002		0.003		ND	0.005	ND	0.002	0.006	
cis-1,2-Dichloroethene (DCE)	0.838		ND	0.002	0.005		0.006		0.075		ND	0.002	0.006	
trans-1,2-Dichloroethene	ND	0.005	ND	0.002	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002
Methylene chloride	ND	0.005	ND	0.002	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002
Tetrachloroethene (PCE)	ND	0.005	ND	0.002	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002
Toluene	ND	0.005	0.001		0.005		ND	0.001	ND	0.005	ND	0.001	ND	0.001
1,1,1-Trichloroethane (TCA)	ND	0.005	ND	0.002	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002
Trichloroethene (TCE)	ND	0.005	ND	0.002	0.008		0.013		4.857		0.014		0.13	
Vinyl chloride	ND	0.005	ND	0.01	ND	0.005	ND	0.01	ND	0.005	ND	0.005	ND	0.01
Metals														
Iron	0.167													
Manganese	0.081													
Barium			0.3		0.1		0.06				0.16		0.14	
Nickel			ND	0.01	0.07		0.05				ND	0.01	0.02	
Selenium			ND	0.01	ND	0.01	ND	0.01			ND	0.01	ND	0.01
PHCs														

TABLE 1

SUMMARY OF GROUNDWATER TESTING

Digital Equipment Corporation
San German, Puerto Rico
mg/l

Sample ID:	OW-103				OW-105				OW-106							
Date:	1992		1993		1992		1993		1992		1993		1993-DUP		1994	
	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL
Volatile Organic Compounds																
Chloroform	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005
1,1-Dichloroethane (DCA)	0.003		0.003		0.005		ND	0.002	0.002		0.003		0.003		ND	0.005
1,2-Dichloroethane	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005
1,1-Dichloroethene	0.003		0.007		0.008		ND	0.002	ND	0.002	0.004		0.004		ND	0.005
cis-1,2-Dichloroethene (DCE)	0.018		0.024		0.007		ND	0.002	0.008		0.022		0.022		0.021	
trans-1,2-Dichloroethene	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005
Methylene chloride	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005
Tetrachloroethene (PCE)	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005
Toluene	ND	0.001	ND	0.001	0.001		ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005
1,1,1-Trichloroethane (TCA)	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005
Trichloroethene (TCE)	0.014		0.018		0.016		ND	0.002	0.004		0.01		0.009		ND	0.005
Vinyl chloride	ND	0.005	ND	0.01	ND	0.005	ND	0.01	ND	0.005	ND	0.01	ND	0.01	ND	0.005
Metals																
Iron																
Manganese																
Barium	0.06		0.08		0.08		0.15		0.08		0.08					
Nickel	0.08		0.07		0.14		ND	0.01	0.04		0.05					
Selenium	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01				
PHCs																

TABLE 1

SUMMARY OF GROUNDWATER TESTING

Digital Equipment Corporation
San German, Puerto Rico
mg/l

Sample ID:	OW-301						OW-302				OW-303A					
Date:	1992		1993		1994		1992		1993		1992		1993		1994	
	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL
Volatile Organic Compounds																
Chloroform	ND	0.002	ND	0.002	ND	0.005	0.002		ND	0.002	ND	0.002	0.005		ND	0.005
1,1-Dichloroethane (DCA)	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005
1,2-Dichloroethane	ND	0.002	ND	0.002	0.295		ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005
1,1-Dichloroethene	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005
cis-1,2-Dichloroethene (DCE)	ND	0.002	ND	0.002	ND	0.005	0.007		0.045		0.008		0.004		0.014	
trans-1,2-Dichloroethene	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005
Methylene chloride	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005
Tetrachloroethene (PCE)	ND	0.002	ND	0.002	ND	0.005	0.002		0.003		ND	0.002	ND	0.002	ND	0.005
Toluene	ND	0.001	ND	0.001	ND	0.005	ND	0.001	ND	0.001	ND	0.001	ND	0.001	ND	0.005
1,1,1-Trichloroethane (TCA)	ND	0.002	ND	0.002	ND	0.005	ND	0.002	ND	0.002	ND	0.002	ND	0.002	ND	0.005
Trichloroethene (TCE)	ND	0.002	ND	0.002	ND	0.005	0.049		0.05		0.005		0.007		ND	0.005
Vinyl chloride	ND	0.005	ND	0.005	ND	0.005	ND	0.005	ND	0.01	ND	0.005	ND	0.01	ND	0.005
Metals																
Iron																
Manganese																
Barium	0.4		0.53				0.52		0.69		0.1		0.09			
Nickel	ND	0.01	ND	0.01			ND	0.01	ND	0.01	ND	0.01	ND	0.01		
Selenium	ND	0.01	ND	0.01			ND	0.01	ND	0.01	ND	0.01	ND	0.01		
PHCs																

TABLE 1

SUMMARY OF GROUNDWATER TESTING

Digital Equipment Corporation
San German, Puerto Rico
mg/l

Sample ID:	OW-304				OW-304				OW-305					
Date:	1992		1993		1993-DUP		1994		1992		1993		1994	
	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL
Volatile Organic Compounds														
Chloroform	ND	0.2	ND	0.5	ND	0.5	0.74		ND	0.02	ND	0.2	0.054	
1,1-Dichloroethane (DCA)	ND	0.2	ND	0.5	ND	0.5	ND	0.005	ND	0.02	ND	0.2	ND	0.005
1,2-Dichloroethane	0.2		ND	0.5	ND	0.5	ND	0.005	ND	0.02	ND	0.2	0.139	
1,1-Dichloroethene	ND	0.2	ND	0.5	ND	0.5	ND	0.005	ND	0.02	ND	0.2	ND	0.005
cis-1,2-Dichloroethene (DCE)	0.3		1		1		ND	0.005	2.9		2.4		ND	0.005
trans-1,2-Dichloroethene	ND	0.2	ND	0.5	ND	0.5	ND	0.005	ND	0.02	ND	0.2	ND	0.005
Methylene chloride	ND	0.2	ND	0.5	ND	0.5	ND	0.005					ND	0.005
Tetrachloroethene (PCE)	ND	0.2	ND	0.5	ND	0.5	ND	0.005	ND	0.02	ND	0.2	ND	0.005
Toluene	ND	0.1	ND	0.2	ND	0.2	ND	0.005	ND	0.01	ND	0.1	ND	0.005
1,1,1-Trichloroethane (TCA)	ND	0.2	ND	0.5	ND	0.5	ND	0.005	ND	0.02	ND	0.2	ND	0.005
Trichloroethene (TCE)	19		40		34		11.5		3.8		4		0.139	
Vinyl chloride	ND	0.5	ND	2	ND	2	ND	0.005	0.5		ND	1	ND	0.005
Metals														
Iron														
Manganese														
Barium	0.23		0.3						0.22		0.22			
Nickel	ND	0.01	ND	0.01					ND	0.01	ND	0.01		
Selenium	ND	0.01	ND	0.01					ND	0.01	ND	0.01		
PHCs														

TABLE 1

SUMMARY OF GROUNDWATER TESTING

Digital Equipment Corporation
San German, Puerto Rico
mg/l

Sample ID:	OW-307				OW-307		BR-308						OW-401			
Date:	1992		1993		1994		1992		1993		1994		1993		1994	
	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL
Volatile Organic Compounds																
Chloroform	ND	0.002	ND	0.02	1.11		ND	0.002	ND	0.02	0.069		ND	0.02	0.031	
1,1-Dichloroethane (DCA)	ND	0.002	ND	0.02	0.088		0.004		ND	0.02	ND	0.005	ND	0.02	0.156	
1,2-Dichloroethane	ND	0.002	ND	0.02	ND	0.005	ND	0.002	ND	0.02	ND	0.005	ND	0.02	ND	0.005
1,1-Dichloroethene	ND	0.002	ND	0.02	ND	0.005	0.011		ND	0.02	ND	0.005	ND	0.02	ND	0.005
cis-1,2-Dichloroethene (DCE)	0.11		0.13		ND	0.005	0.074		0.13		ND	0.005	0.11		ND	0.005
trans-1,2-Dichloroethene	ND	0.002	ND	0.02	ND	0.005	ND	0.002	ND	0.02	ND	0.005	ND	0.02	ND	0.005
Methylene chloride	ND	0.002	ND	0.02	ND	0.005	ND	0.002	ND	0.02	0.486		ND	0.02	ND	0.005
Tetrachloroethene (PCE)	ND	0.002	ND	0.02	ND	0.005	ND	0.002	ND	0.02	ND	0.005	ND	0.02	ND	0.005
Toluene	ND	0.001	ND	0.01	ND	0.005	ND	0.001	ND	0.01	ND	0.005	ND	0.01	ND	0.005
1,1,1-Trichloroethane (TCA)	ND	0.002	ND	0.02	ND	0.005	ND	0.002	ND	0.02	ND	0.005	ND	0.02	ND	0.005
Trichloroethene (TCE)	0.12		0.19		0.32		0.086		0.23		0.109		0.19		0.118	
Vinyl chloride	0.053		ND	0.1	ND	0.005	0.018		ND	0.1	ND	0.005	ND	0.1	ND	0.005
Metals																
Iron											0.134					
Manganese											0.12					
Barium	0.37		0.28				0.47		0.55				0.52			
Nickel	ND	0.01	ND	0.01			ND	0.01	ND	0.01			ND	0.01		
Selenium	ND	0.01	ND	0.01			0.11		ND	0.01			ND	0.01		
PHCs							ND	0.001								

TABLE 1

SUMMARY OF GROUNDWATER TESTING

Digital Equipment Corporation
San German, Puerto Rico
mg/l

Sample ID:	OW-402U		OW-402L		OW-403				OW-404L		OW-404U		OW-405		OW-406	
Date:	1993		1993		1993		1994		1993		1994		1993		1994	
	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL
Volatile Organic Compounds																
Chloroform	ND	0.02	ND	0.02	ND	0.02	ND	0.005	ND	0.02	ND	0.005	ND	0.002	ND	0.005
1,1-Dichloroethane (DCA)	ND	0.02	ND	0.02	ND	0.02	ND	0.005	ND	0.02	ND	0.005	ND	0.002	ND	0.005
1,2-Dichloroethane	ND	0.02	ND	0.02	ND	0.02	ND	0.005	ND	0.02	ND	0.005	ND	0.002	ND	0.005
1,1-Dichloroethene	ND	0.02	ND	0.02	ND	0.02	ND	0.005	ND	0.02	ND	0.005	ND	0.002	ND	0.005
cis-1,2-Dichloroethene (DCE)	0.1		0.06		0.06		ND	0.005	0.18		ND	0.005	ND	0.002	0.015	
trans-1,2-Dichloroethene	ND	0.02	ND	0.02	ND	0.02	ND	0.005	ND	0.02	ND	0.005	ND	0.002	ND	0.005
Methylene chloride	ND	0.02	ND	0.02	ND	0.02	ND	0.005	ND	0.02	ND	0.005	ND	0.002	ND	0.005
Tetrachloroethene (PCE)	ND	0.02	0.03		ND	0.02	ND	0.005	ND	0.02	ND	0.005	ND	0.002	ND	0.005
Toluene	ND	0.01	ND	0.01	ND	0.01	ND	0.005	ND	0.01	ND	0.005	ND	0.001	ND	0.005
1,1,1-Trichloroethane (TCA)	ND	0.02	ND	0.02	ND	0.02	ND	0.005	ND	0.02	ND	0.005	ND	0.002	ND	0.005
Trichloroethene (TCE)	0.23		0.31		0.71		ND	0.005	0.16		ND	0.005	0.06		ND	0.005
Vinyl chloride	ND	0.1	ND	0.1	ND	0.1	ND	0.005	ND	0.1	ND	0.005	ND	0.01	ND	0.005
Metals																
Iron																
Manganese																
Barium	0.61		0.63		0.23				0.44				0.27			
Nickel	0.03		ND	0.01	0.02				ND	0.01			ND	0.01		
Selenium	ND	0.01	ND	0.01	ND	0.01			ND	0.01			ND	0.01		
PHCs																

TABLE 1

SUMMARY OF GROUNDWATER TESTING

Digital Equipment Corporation
San German, Puerto Rico
mg/l

Sample ID:	OW-407		OW-408		DEC-201				DEC-201R						DEC-202	
Date:	1993		1993		1992		1993		1992		1993		1994		1993	
	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL
Volatile Organic Compounds																
Chloroform	ND	0.002	ND	0.02	ND	0.02	ND	0.02			ND	0.02			ND	0.002
1,1-Dichloroethane (DCA)	ND	0.002	ND	0.02	0.15		0.12				0.11				0.019	
1,2-Dichloroethane	ND	0.002	ND	0.02	ND	0.02	ND	0.02			ND	0.02			ND	0.002
1,1-Dichloroethene	ND	0.002	ND	0.02	0.07		0.06				0.05				0.077	
cis-1,2-Dichloroethene (DCE)	ND	0.002	0.17		0.31		0.25				0.25				0.037	
trans-1,2-Dichloroethene	ND	0.002	ND	0.02	ND	0.02	ND	0.02			ND	0.02			ND	0.002
Methylene chloride	ND	0.002	ND	0.02	ND	0.02	ND	0.02			ND	0.02			ND	0.002
Tetrachloroethene (PCE)	ND	0.002	ND	0.02	ND	0.02	0.02				0.02				0.03	
Toluene	ND	0.001	ND	0.01	ND	0.01	ND	0.01			ND	0.01			ND	0.001
1,1,1-Trichloroethane (TCA)	ND	0.002	ND	0.02	ND	0.02	ND	0.02			ND	0.02			0.2	
Trichloroethene (TCE)	ND	0.002	0.77		ND	0.02	ND	0.02			ND	0.02			0.005	
Vinyl chloride	ND	0.01	ND	0.01	ND	0.05	ND	0.1			ND	0.1			ND	0.01
Metals																
Iron																
Manganese																
Barium	0.13		0.69						0.9		0.96				0.09	
Nickel	ND	0.01	ND	0.01					0.02		ND	0.01			ND	0.01
Selenium	ND	0.01	ND	0.01					ND	0.01	ND	0.01			ND	0.01
PHCs					5		21						35		ND	0.001

TABLE 1

SUMMARY OF GROUNDWATER TESTING

Digital Equipment Corporation
San German, Puerto Rico
mg/l

Sample ID:	DEC-203				DEC-203R				DEC-204				DEC-205			
Date:	1992		1993		1992		1993		1992		1993		1992		1993	
	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL	RESULT	MDL
Volatile Organic Compounds																
Chloroform	0.003		ND	0.002												
1,1-Dichloroethane (DCA)	0.024		ND	0.002					0.007		0.007		ND	0.002	ND	0.002
1,2-Dichloroethane	ND	0.002	ND	0.002					0.047		0.012		ND	0.002	ND	0.002
1,1-Dichloroethene	0.14		0.18						ND	0.002	ND	0.002	ND	0.002	ND	0.002
cis-1,2-Dichloroethene (DCE)	0.002		ND	0.002					0.12		0.016		0.03		0.085	
trans-1,2-Dichloroethene	ND	0.002	ND	0.002					0.009		ND	0.002	ND	0.002	ND	0.002
Methylene chloride	ND	0.002	ND	0.002					ND	0.002	ND	0.002	ND	0.002	ND	0.002
Tetrachloroethene (PCE)	0.059		0.05						ND	0.002	ND	0.002	ND	0.002	ND	0.002
Toluene	ND	0.001	ND	0.001					0.068		0.034		0.024		0.021	
1,1,1-Trichloroethane (TCA)	0.014		0.28						ND	0.001	ND	0.001	ND	0.001	ND	0.001
Trichloroethene (TCE)	0.06		0.03						0.05		0.016		ND	0.002	0.16	
Vinyl chloride	ND	0.005	ND	0.01					0.099		0.022		0.008		0.004	
									ND	0.005	ND	0.01	ND	0.005	ND	0.01
Metals																
Iron																
Manganese																
Barium					0.06		0.05		0.19		0.23		0.38		0.22	
Nickel					ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
Selenium					ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01	ND	0.01
PHCs	ND	0.001	ND	0.001					ND	0.001	ND	0.001	ND	0.001	ND	0.001

TABLE 1

SUMMARY OF GROUNDWATER TESTING

Digital Equipment Corporation
San German, Puerto Rico
mg/l

NOTES:

1. Groundwater Sampling Dates:
   1992 - Samples collected on September 3 and 4, 1992
   1993 - Samples collected on February 19, 22, and 23, 1993
   1994 - Samples collected on November 28, 29, and 30, 1994

2. All groundwater samples were collected by GZA personnel.

3. Samples collected in 1992 and 1993 were analyzed by Eastern Analytical, Inc. of Concord, New Hampshire. Samples collected in 1994 were analyzed by Beckton Analytical Laboratories, Inc. of Ponce, Puerto, Rico.

4. Refer to the Phase I, Phase II, and IMP reports for field procedures, analytical methods, and laboratory analytical reports.

5. All concentrations in milligrams per liter (mg/l).

6. A blank entry indicates that the compound was not analyzed for.

7. "ND" indicates that the compound was not detected above the Method Detection Limit (MDL).

8. "PHC" - Petroleum Hydrocarbons.

TABLE 2

SUMMARY OF POTENTIAL EXPOSURE PATHWAYS

Digital Equipment Corporation
San Germán, Puerto Rico

TRANSPORT MEDIUM	RELEASE SOURCE/ MECHANISM	PRIMARY RECEPTORS/ EXPOSURE POINTS	PRIMARY ROUTES OF EXPOSURE	PRIMARY CONTAMINANTS OF CONCERN	DISCUSSION	PATHWAY COMPLETION POSSIBLE?	ADDITIONAL INFORMATIO N REQUIRED
Groundwater	Dissolution from non-aqueous phase liquid (NAPL) residual remaining in the subsurface above and below the water table	1. Residents - public drinking water supply wells	. Ingestion . Direct contact . Inhalation	Chlorinated volatile organics, including: trichloroethene, 1,2-dichloroethene, vinyl chloride, methylene chloride, 1,1-dichloroethene, 1,2-dichloroethane, and tetrachloroethene, observed at concentrations above Federal Drinking Water Standard Maximum Contaminant Levels. Vinyl chloride also detected in a limited number of samples.	Public water supply wells are located 2,000 feet south southeast of the site within alluvial aquifer associated with the Guanajibo River. The wells are located upstream of any likely flow path from the site, many across the Guanajibo River from the site and are thought to be hydrologically isolated .	No	None
		2. Residents - private water supply wells	. Ingestion . Direct contact . Inhalation		Two wells located within the El Convento housing district approximately 500 feet south; inferred to be bedrock wells based on setting. One well is reportedly used for filling a swimming pool and for lawn watering; use of the other well is unknown. Primary groundwater flow direction from the site is indicated to be westerly and not toward these wells. Wells may be located at equal or slightly higher elevation with respect to site, under non-withdrawal conditions would likely be upgradient of the site at the water table. Deeper flow path from the site southerly towards the Guanajibo River may be present.	Unknown, but thought to be unlikely. Pathway could be blocked through migration control groundwater extraction and treatment.	Information on the elevation depth, construction, yield, and present use of these wells. To date this information is unavailable.

TABLE 2

SUMMARY OF POTENTIAL EXPOSURE PATHWAYS

Digital Equipment Corporation
San Germán, Puerto Rico

TRANSPORT MEDIUM	RELEASE SOURCE/ MECHANISM	PRIMARY RECEPTORS/ EXPOSURE POINTS	PRIMARY ROUTES OF EXPOSURE	PRIMARY CONTAMINANTS OF CONCERN	DISCUSSION	PATHWAY COMPLETION POSSIBLE?	ADDITIONAL INFORMATIO N REQUIRED
Surface Water	Contaminated groundwater discharging to surface water in the Guanajibo River	Public users of the Guanajibo River	. Direct contact . Incidental ingestion	As noted above, chlorinated volatile organics detected in groundwater at the site about 1,800 feet from the Guanajibo River, but not in surface water samples collected downstream at two locations; petroleum hydrocarbons (PHCs) were also not detected.	Metals also were not detected at concentrations greater than upstream samples. Due to apparently poor historical water quality (high fecal coliform, and fecal streptococci), it is expected that the Guanajibo River would not normally be used for human contact recreation.	No	None
Stream Sediments	Partitioning and adsorption of constituents from groundwater discharging to the Guanajibo River	Public Users of the Guanajibo River	. Direct contact . Incidental ingestion	Chlorinated volatile organics and PHCs	Analytical laboratory testing of river sediments did not indicate the presence of volatile organics or PHCs	No	None
Subsurface Soils	Near-surface residual contamination	Persons working at or visiting the facility	. Direct contact . Incidental ingestion . Inhalation	Chlorinated volatile organics and PHCs	Soil gas sampling and sampling of soils indicates that volatile organic compounds (VOCs) are present at least in limited concentrations in soils beneath the building floor slab in the waste treatment, finish good areas of Building 2, and the loading dock, electrical test and solder mask areas of Building 1. Institutional controls requiring the presence of qualified health and safety trained personnel and work place monitoring of any on-site excavation are recommended.	Not under present use conditions. Some potential in the event of excavation through contaminated soils if necessary for installation and repair of utilities or other reason.	None

TABLE 2

SUMMARY OF POTENTIAL EXPOSURE PATHWAYS

Digital Equipment Corporation
San Germán, Puerto Rico

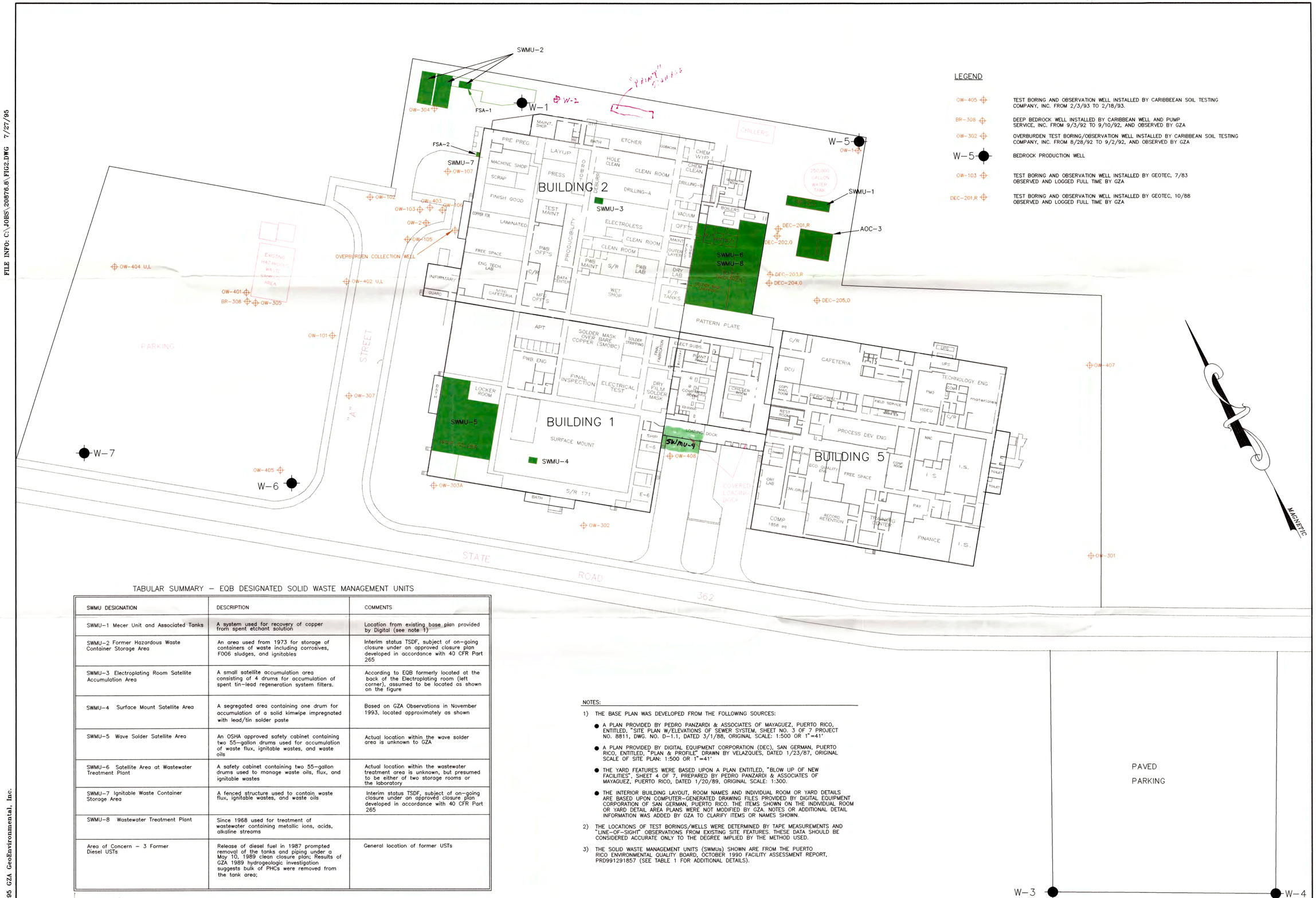
TRANSPORT MEDIUM	RELEASE SOURCE/ MECHANISM	PRIMARY RECEPTORS/ EXPOSURE POINTS	PRIMARY ROUTES OF EXPOSURE	PRIMARY CONTAMINANTS OF CONCERN	DISCUSSION	PATHWAY COMPLETION POSSIBLE?	ADDITIONAL INFORMATIO N REQUIRED
Soil Gas	Partitioning from aqueous and NAPL phases into the soil gas and migration into the occupied building space by advection and diffusion	Persons working at or visiting the facility	Inhalation	Volatile organics and PHCs	Soil gas sampling and sampling of soils indicates that VOCs are present at least in limited concentrations in soils beneath the building floor slab in the waste treatment, finish good areas of Building 2, and the loading dock, electrical test and solder mask areas of Building 1. Building HVAC system designed to provide positive pressure conditions and would therefore limit the migration of vapors into the building. Soil vapor extraction implemented as a part of a remedial strategy for the loading dock area would also tend to limit inflow of vapors.	Thought to be unlikely.	None

NOTE:

The Primary Contaminants of Concern are constituents highlighted due to detection at concentrations relative to potentially applicable regulatory standards, and/or those believed by GZA to contribute most potential risks to human health.

FIGURES

FILE INFO: C:\JOBS\20876.8\FIG2.DWG 7/27/95



LEGEND

OW-405	TEST BORING AND OBSERVATION WELL INSTALLED BY CARIBBEEAN SOIL TESTING COMPANY, INC. FROM 2/3/93 TO 2/18/93.
BR-308	DEEP BEDROCK WELL INSTALLED BY CARIBBEAN WELL AND PUMP SERVICE, INC. FROM 9/3/92 TO 9/10/92, AND OBSERVED BY GZA
OW-302	OVERBURDEN TEST BORING/OBSERVATION WELL INSTALLED BY CARIBBEAN SOIL TESTING COMPANY, INC. FROM 8/28/92 TO 9/2/92, AND OBSERVED BY GZA
W-5	BEDROCK PRODUCTION WELL
OW-103	TEST BORING AND OBSERVATION WELL INSTALLED BY GEOTEC, 7/83 OBSERVED AND LOGGED FULL TIME BY GZA
DEC-201,R	TEST BORING AND OBSERVATION WELL INSTALLED BY GEOTEC, 10/88 OBSERVED AND LOGGED FULL TIME BY GZA

TABULAR SUMMARY – EQB DESIGNATED SOLID WASTE MANAGEMENT UNITS

SWMU DESIGNATION	DESCRIPTION	COMMENTS
SWMU-1 Mecer Unit and Associated Tanks	A system used for recovery of copper from spent etchant solution	Location from existing base plan provided by Digital (see note 1)
SWMU-2 Former Hazardous Waste Container Storage Area	An area used from 1973 for storage of containers of waste including corrosives, F006 sludges, and ignitables	Interim status TSDF, subject of on-going closure under an approved closure plan developed in accordance with 40 CFR Part 265
SWMU-3 Electroplating Room Satellite Accumulation Area	A small satellite accumulation area consisting of 4 drums for accumulation of spent tin-lead regeneration system filters.	According to EQB formerly located at the back of the Electroplating room (left corner), assumed to be located as shown on the figure
SWMU-4 Surface Mount Satellite Area	A segregated area containing one drum for accumulation of a solid kimwipe impregnated with lead/tin solder paste	Based on GZA Observations in November 1993, located approximately as shown
SWMU-5 Wave Solder Satellite Area	An OSHA approved safety cabinet containing two 55-gallon drums used for accumulation of waste flux, ignitable wastes, and waste oils	Actual location within the wave solder area is unknown to GZA
SWMU-6 Satellite Area at Wastewater Treatment Plant	A safety cabinet containing two 55-gallon drums used to manage waste oils, flux, and ignitable wastes	Actual location within the wastewater treatment area is unknown, but presumed to be either of two storage rooms or the laboratory
SWMU-7 Ignitable Waste Container Storage Area	A fenced structure used to contain waste flux, ignitable wastes, and waste oils	Interim status TSDF, subject of on-going closure under an approved closure plan developed in accordance with 40 CFR Part 265
SWMU-8 Wastewater Treatment Plant	Since 1968 used for treatment of wastewater containing metallic ions, acids, alkaline streams	
Area of Concern – 3 Former Diesel USTs	Release of diesel fuel in 1987 prompted removal of the tanks and piping under a May 10, 1989 clean closure plan; Results of GZA 1989 hydrogeologic investigation suggests bulk of PHCs were removed from the tank area;	General location of former USTs

SWMU-9 LOADING DOCK

NOTES:

1) THE BASE PLAN WAS DEVELOPED FROM THE FOLLOWING SOURCES:
   - A PLAN PROVIDED BY PEDRO PANZARDI & ASSOCIATES OF MAYAGUEZ, PUERTO RICO, ENTITLED, "SITE PLAN W/ELEVATIONS OF SEWER SYSTEM, SHEET NO. 3 OF 7 PROJECT NO. 8811, DWG. NO. D-1.1, DATED 3/1/88, ORIGINAL SCALE: 1:500 OR 1"=41'
   - A PLAN PROVIDED BY DIGITAL EQUIPMENT CORPORATION (DEC), SAN GERMAN, PUERTO RICO, ENTITLED, "PLAN & PROFILE" DRAWN BY VELAZQUES, DATED 1/23/87, ORIGINAL SCALE OF SITE PLAN: 1:500 OR 1"=41'
   - THE YARD FEATURES WERE BASED UPON A PLAN ENTITLED, "BLOW UP OF NEW FACILITIES", SHEET 4 OF 7, PREPARED BY PEDRO PANZARDI & ASSOCIATES OF MAYAGUEZ, PUERTO RICO, DATED 1/20/89, ORIGINAL SCALE: 1:300.
   - THE INTERIOR BUILDING LAYOUT, ROOM NAMES AND INDIVIDUAL ROOM OR YARD DETAILS ARE BASED UPON COMPUTER-GENERATED DRAWING FILES PROVIDED BY DIGITAL EQUIPMENT CORPORATION OF SAN GERMAN, PUERTO RICO. THE ITEMS SHOWN ON THE INDIVIDUAL ROOM OR YARD DETAIL AREA PLANS WERE NOT MODIFIED BY GZA. NOTES OR ADDITIONAL DETAIL INFORMATION WAS ADDED BY GZA TO CLARIFY ITEMS OR NAMES SHOWN.
2) THE LOCATIONS OF TEST BORINGS/WELLS WERE DETERMINED BY TAPE MEASUREMENTS AND "LINE-OF-SIGHT" OBSERVATIONS FROM EXISTING SITE FEATURES. THESE DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
3) THE SOLID WASTE MANAGEMENT UNITS (SWMUs) SHOWN ARE FROM THE PUERTO RICO ENVIRONMENTAL QUALITY BOARD, OCTOBER 1990 FACILITY ASSESSMENT REPORT, PRD991291857 (SEE TABLE 1 FOR ADDITIONAL DETAILS).

	BY	DATE

DESCRIPTION

REV#

APPROXIMATE SCALE 0' 50' 100' 150'

GZA GeoEnvironmental, Inc.
Engineers and Scientists
4 FREE STREET
PORTLAND, MAINE 04101
(207)879-9190

DESIGNED BY : JRP
CHECKED BY : JRP
APPROVED BY: MJB
DRAWN BY : DRE
SCALE : AS SHOWN
DATE : JULY 1995

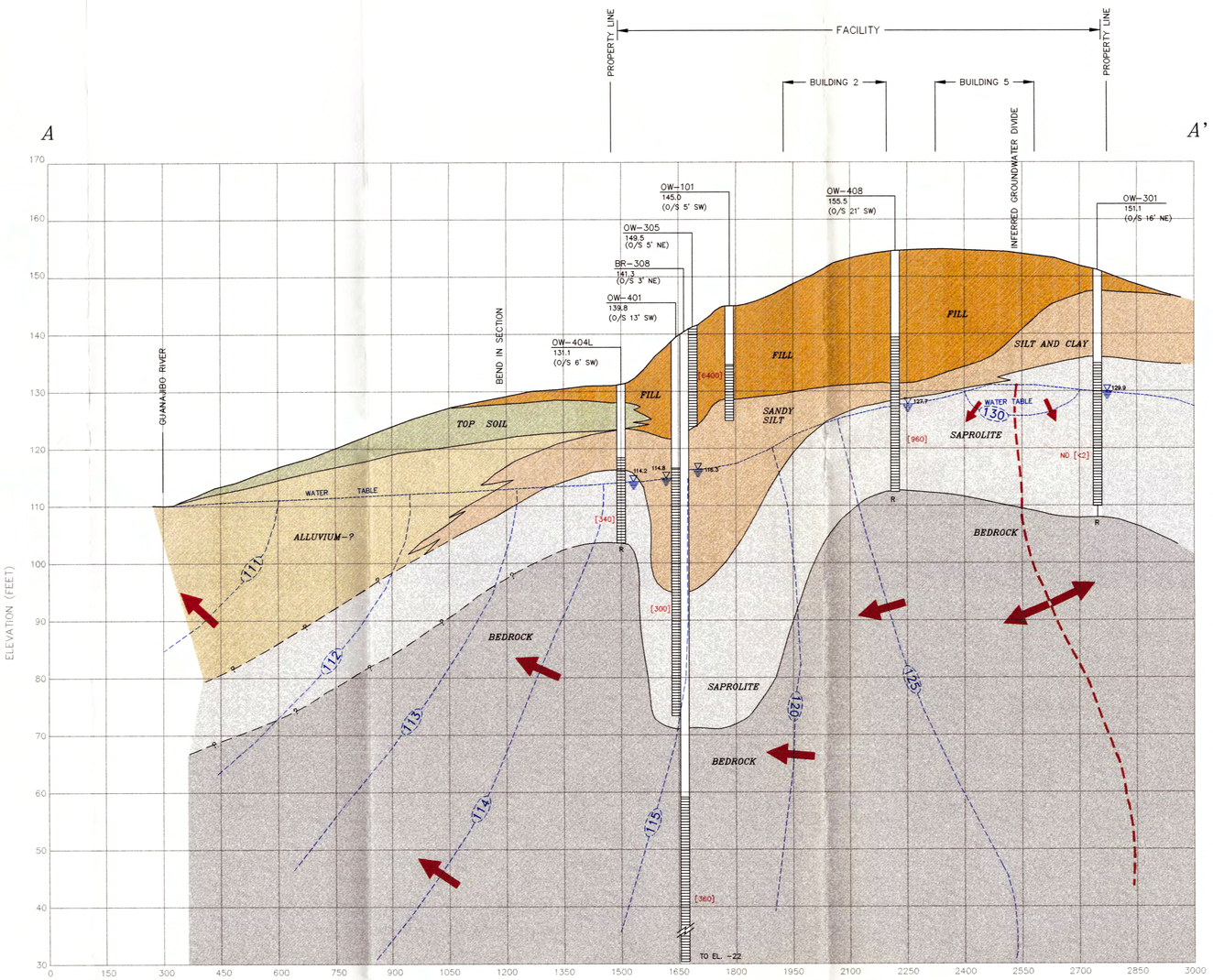
RCRA FACILITY INVESTIGATION SUMMARY REPORT
FORMER DIGITAL EQUIPMENT CORPORATION
SAN GERMAN, PUERTO RICO

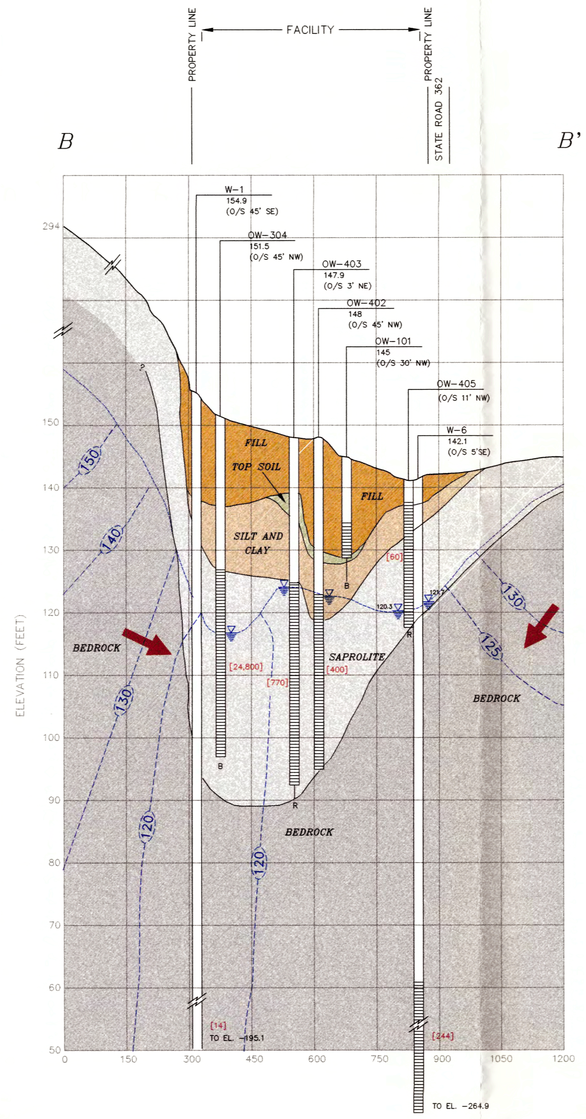
SITE PLAN

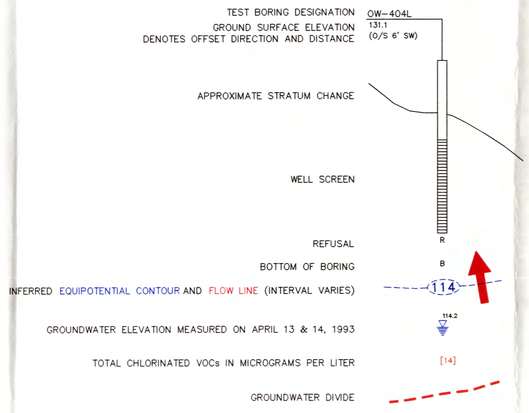
SWMUs

PROJECT No.: 20876.8

SHEET No.: 2







NOTES:

1) THE STRATIFICATION LINES ARE APPROXIMATE, BASED UPON DATA FROM A LIMITED NUMBER OF WIDELY SPACED EXPLORATIONS AND THUS REPRESENT APPROXIMATE BOUNDARIES BETWEEN STRATUM TYPES. THE ACTUAL TRANSITIONS ARE EXPECTED TO BE MORE GRADUAL AND VARY FROM THOSE SHOWN.

2) THE EQUIPOTENTIAL CONTOURS DEPICTED ON THE PROFILES HAVE BEEN ESTIMATED USING GENERALLY ACCEPTED HYDROGEOLOGIC PRACTICES, BASED UPON LIMITED INFORMATION AND WIDELY SPACED DATA POINTS. THE EQUIPOTENTIALS ARE INTENDED TO DEPICT INFERRED TRENDS IN GROUNDWATER FLOW CONDITIONS CONSISTENT WITH AVAILABLE INFORMATION. THE ACTUAL CONDITIONS WILL VARY FROM THOSE SHOWN. OTHER INTERPRETATIONS ARE POSSIBLE.

3) TOTAL CHLORINATED VOCs VALUE EQUAL TO THE SUM OF CHLORINATED COMPOUNDS DETECTED IN WATER QUALITY SAMPLING CONDUCTED BETWEEN FEBRUARY 19 AND 23, 1993 EXCEPT FOR PRODUCTION WELLS W-1 AND W-6 WHICH WERE SAMPLED ON APRIL 14, 1993.

4) REFER TO FIGURES 1 AND 2 FOR ADDITIONAL NOTES AND LEGEND.

DATE	BY	DESCRIPTION	REV#

GRAPHIC SCALE 150' 0' 150' 300' 450'

GZA GeoEnvironmental, Inc.
Engineers and Scientists
4 FREE STREET
PORTLAND, MAINE 04101
(207)879-9190

DESIGNED BY : JRP
CHECKED BY : JRP
APPROVED BY: MJB
DRAWN BY : DRE
SCALE : AS SHOWN
DATE : JULY 1995

RCRA FACILITY INVESTIGATION SUMMARY REPORT
FORMER DIGITAL EQUIPMENT CORPORATION
SAN GERMAN, PUERTO RICO

GEOLOGIC CROSS SECTIONS

PROJECT No.: 20876.8
SHEET No.: 3

B

B''

NOTES:

1) REFER TO FIGURES 2 AND 3 FOR ADDITIONAL NOTES AND LEGEND.

PROPERTY LINE

PROPERTY LINE

FACILITY

STATE ROAD 362

W-1
154.9
0/S 45' SE

OW-304
151.5
0/S 45' NW

OW-403
147.9
0/S 34' NW

OW-402
148
0/S 100' NW

OW-101
145
0/S 92' NW

OW-405
0/S 96' NW

W-6
142.1
0/S 80' NW

PROFILE
CENTER OF HILL
(400' SE)

RIO GUANAJIBO

120±

TOPSOIL

FILL

SILT AND CLAY

SAPROLITE

BEDROCK

BEDROCK

BEDROCK

116.8

120.3

121.7

[24,800]

[770]

[400]

[60]

150

140

130

120

140

130

OPEN HOLE IN BEDROCK

OPEN HOLE IN BEDROCK

FRACTURE

FRACTURE

FRACTURE

FRACTURE

FRACTURE

FRACTURE

[14]

[244]

300
240
180
120
60
0
−60
−120
−180
−240

0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200

GRAPHIC SCALE 0' 200' 400'

GZA GeoEnvironmental, Inc.
Engineers and Scientists
4 FREE STREET
PORTLAND, MAINE 04101
(207)879-9190

DES'D BY : JRP
CHK'D BY : JRP
APP'D BY : MJB
DRAWN BY : DRE
SCALE : AS SHOWN
DATE : JULY 1995

RCRA FACILITY INVESTIGATION SUMMARY REPORT
FORMER DIGITAL EQUIPMENT CORPORATION
SAN GERMAN, PUERTO RICO

SCHEMATIC HYDROGEOLOGIC PROFILE B-B''

PROJECT No.: 20876.8

FIGURE No.: 4

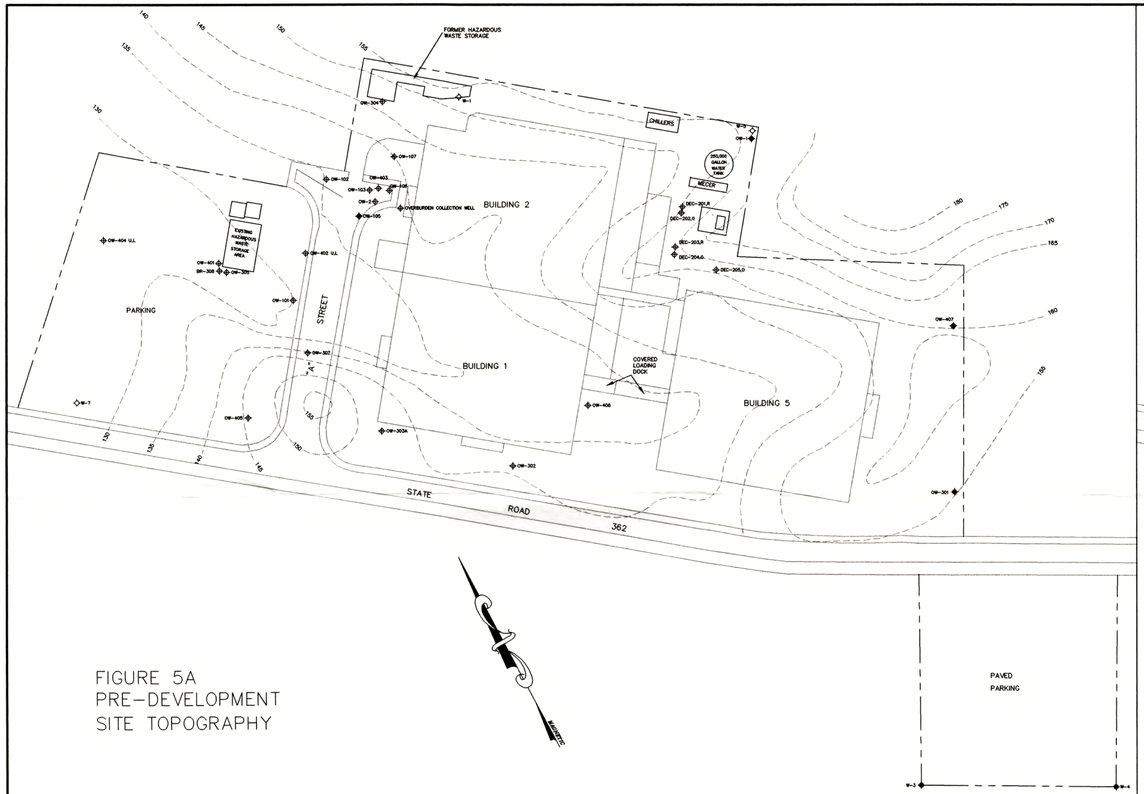


FIGURE 5A
PRE-DEVELOPMENT
SITE TOPOGRAPHY

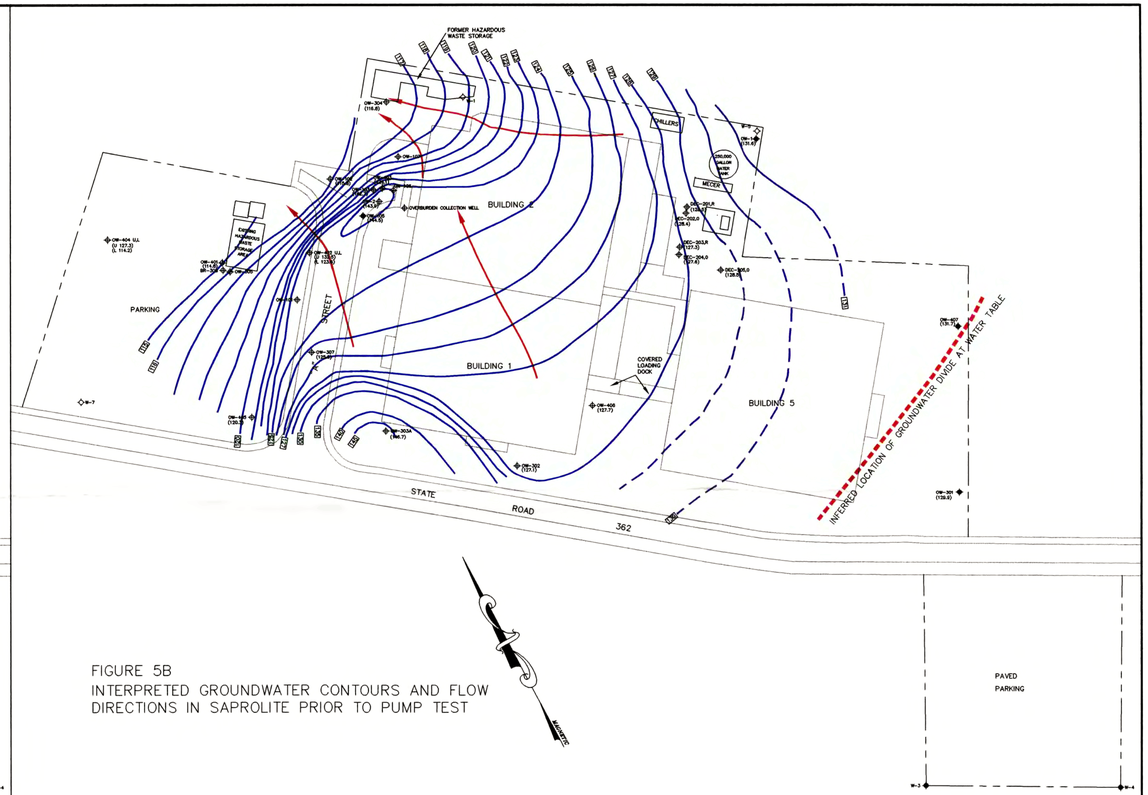


FIGURE 5B
INTERPRETED GROUNDWATER CONTOURS AND FLOW DIRECTIONS IN SAPROLITE PRIOR TO PUMP TEST

NOTES

1) THE PRE-DEVELOPMENT SITE TOPOGRAPHY SHOWN WAS TAKEN FROM A PLAN ENTITLED, "SITE PLAN", PROVIDED BY DIGITAL EQUIPMENT CORPORATION, DATE UNKNOWN, ORIGINAL SCALE: 1:500, DATUM UNKNOWN.

2) WATER LEVELS WERE MEASURED BY GZA PERSONNEL ON APRIL 13 AND 14, 1993. THE ELEVATIONS SHOWN ARE REFERENCED TO AN ASSUMED DATUM OF 154 FEET, RELATIVE TO BENCHMARK NO. 19 (US GEODETICAL SURVEY) LOCATED AT THE BRIDGE ON ROAD 119, KM 0.4 IN SAN GERMAN, PUERTO RICO.

3) THE GROUNDWATER LEVELS WERE MEASURED AT TIMES AND UNDER CONDITIONS STATED IN THE REPORT. FLUCTUATIONS IN THE GROUNDWATER LEVEL MAY OCCUR DUE TO VARIATIONS IN PUMPING, BAROMETRIC PRESSURE, PRECIPITATION, AND OTHER FACTORS.

4) THE GROUNDWATER ELEVATION CONTOURS DEPICTED WERE INFERRED BASED ON WIDELY SPACED DATA POINTS. ALTERNATE INTERPRETATIONS ARE POSSIBLE. GROUNDWATER CONTOURS AND FLOW DIRECTIONS REPRESENT A CONCEPTUAL INTERPRETATION OF GROUNDWATER CONDITIONS IN THE SAPROLITE, BASED ON WATER LEVELS MEASURED IN MONITORING WELLS SCREENED IN THE SAPROLITE DEPOSITS. VARIATIONS IN SHALLOW GROUNDWATER FLOW ARE LIKELY DUE TO EFFECTS OF UNDERGROUND WATER LINE LEAKAGES, BURIED FILL, HETEROGENEOUS ANISOTROPIC AQUIFER CONDITIONS, AND OTHER FACTORS.

5) THE WELL CAPTURE ZONE AS SHOWN WAS DEVELOPED BY SUPERIMPOSITION OF DRAWDOWN MEASUREMENTS RECORDED DURING THE PUMP TEST OF BEDROCK PRODUCTION WELL W-6, ONTO THE PRE-PUMP TEST GROUNDWATER CONTOURS.

6) THE INFERRED GROUNDWATER CONTOURS SHOWN ON FIGURE 5C WERE DEVELOPED BASED ON WATER LEVEL MEASUREMENTS RECORDED AFTER 46.0 TO 47.0 HOURS OF PUMPING (BETWEEN 0740 AND 0830 HOURS ON APRIL 14, 1993) OF ABOUT 50 GALLONS PER MINUTE FROM PRODUCTION WELL W-6.

LEGEND

175	PRE-DEVELOPMENT SITE TOPOGRAPHY IN FEET
(128.5)	GROUNDWATER ELEVATION IN FEET
(U 132.5)	INDICATES UPPER WELL IN TWO WELL CLUSTER
(L 123.6)	INDICATES LOWER WELL IN TWO WELL CLUSTER
131	GROUNDWATER ELEVATION CONTOUR IN FEET
	INFERRED DIRECTION OF GROUNDWATER FLOW
	INFERRED EDGE OF CAPTURE ZONE
[130.7]	EXISTING GROUND SURFACE ELEVATION IN FEET

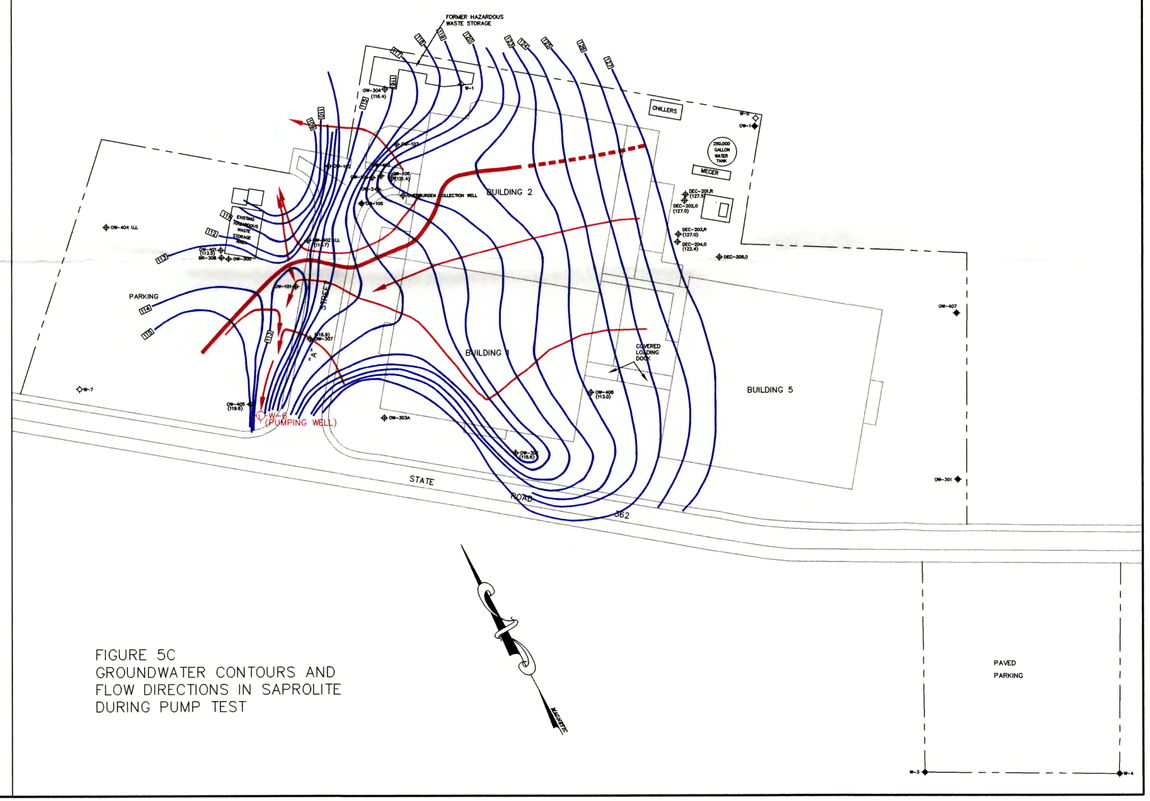


FIGURE 5C
GROUNDWATER CONTOURS AND
FLOW DIRECTIONS IN SAPROLITE
DURING PUMP TEST

DATE	BY	DESCRIPTION	REV#

GRAPHIC SCALE 100' 0' 100' 200' 300'

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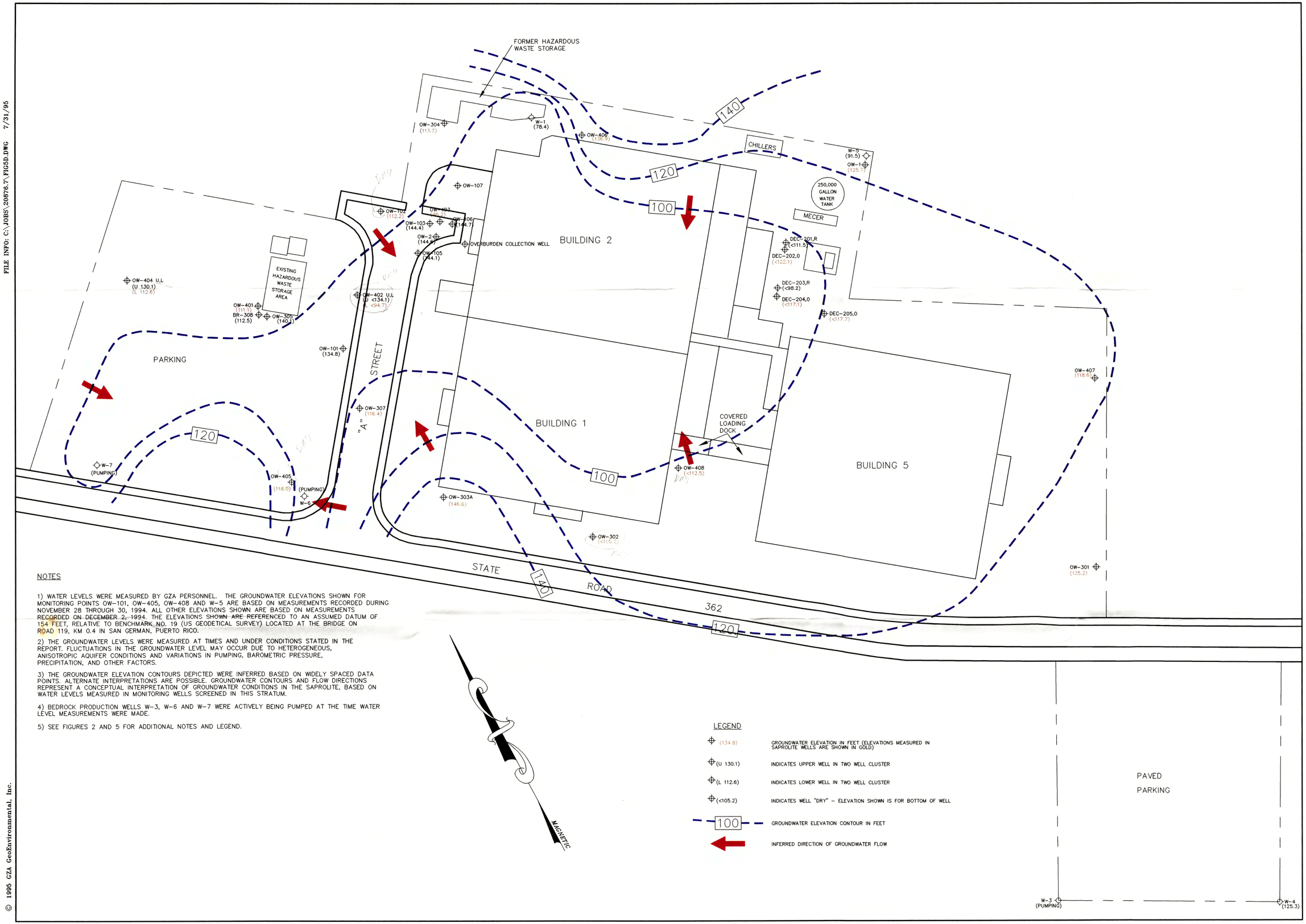
RCRA FACILITY INVESTIGATION SUMMARY REPORT
FORMER DIGITAL EQUIPMENT CORPORATION
SAN GERMAN, PUERTO RICO

PREDEVELOPMENT TOPOGRAPHY AND
INFERRED GROUNDWATER FLOW CONDITIONS

PROJECT No.: 20876.8

SHEET No.: 5

FILE INFO: C:\JOBS\20876.7\FIG5D.DWG 7/31/95



NOTES

1) WATER LEVELS WERE MEASURED BY GZA PERSONNEL. THE GROUNDWATER ELEVATIONS SHOWN FOR MONITORING POINTS OW-101, OW-405, OW-408 AND W-5 ARE BASED ON MEASUREMENTS RECORDED DURING NOVEMBER 28 THROUGH 30, 1994. ALL OTHER ELEVATIONS SHOWN ARE BASED ON MEASUREMENTS RECORDED ON DECEMBER 2, 1994. THE ELEVATIONS SHOWN ARE REFERENCED TO AN ASSUMED DATUM OF 154 FEET, RELATIVE TO BENCHMARK NO. 19 (US GEODETICAL SURVEY) LOCATED AT THE BRIDGE ON ROAD 119, KM 0.4 IN SAN GERMAN, PUERTO RICO.

2) THE GROUNDWATER LEVELS WERE MEASURED AT TIMES AND UNDER CONDITIONS STATED IN THE REPORT. FLUCTUATIONS IN THE GROUNDWATER LEVEL MAY OCCUR DUE TO HETEROGENEOUS, ANISOTROPIC AQUIFER CONDITIONS AND VARIATIONS IN PUMPING, BAROMETRIC PRESSURE, PRECIPITATION, AND OTHER FACTORS.

3) THE GROUNDWATER ELEVATION CONTOURS DEPICTED WERE INFERRED BASED ON WIDELY SPACED DATA POINTS. ALTERNATE INTERPRETATIONS ARE POSSIBLE. GROUNDWATER CONTOURS AND FLOW DIRECTIONS REPRESENT A CONCEPTUAL INTERPRETATION OF GROUNDWATER CONDITIONS IN THE SAPROLITE, BASED ON WATER LEVELS MEASURED IN MONITORING WELLS SCREENED IN THIS STRATUM.

4) BEDROCK PRODUCTION WELLS W-3, W-6 AND W-7 WERE ACTIVELY BEING PUMPED AT THE TIME WATER LEVEL MEASUREMENTS WERE MADE.

5) SEE FIGURES 2 AND 5 FOR ADDITIONAL NOTES AND LEGEND.

LEGEND

(134.8)	GROUNDWATER ELEVATION IN FEET (ELEVATIONS MEASURED IN SAPROLITE WELLS ARE SHOWN IN GOLD)
(U 130.1)	INDICATES UPPER WELL IN TWO WELL CLUSTER
(L 112.6)	INDICATES LOWER WELL IN TWO WELL CLUSTER
(<105.2)	INDICATES WELL "DRY" – ELEVATION SHOWN IS FOR BOTTOM OF WELL
100	GROUNDWATER ELEVATION CONTOUR IN FEET
	INFERRED DIRECTION OF GROUNDWATER FLOW

REV#	DESCRIPTION	BY	DATE

GRAPHIC SCALE 0' 50' 100' 150'

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RCRA FACILITY INVESTIGATION SUMMARY REPORT FORMER DIGITAL EQUIPMENT CORPORATION

SAN GERMAN, PUERTO RICO

GROUNDWATER CONTOUR PLAN NOVEMBER 1994 WATER LEVELS

PROJECT No.: 20876.8

SHEET No.: 5D

SG-101 — SOIL GAS SAMPLE LOCATION AND DESIGNATION

(0.12) — OBSERVED CONCENTRATION OF TOTAL VOCs IN SOIL GAS IN PARTS PER MILLION (ppm) BY VOLUME.

(BMDL) — INDICATES PROBABLE PRESENCE OF VOCs AT CONCENTRATIONS BELOW METHOD DETECTION LIMIT

(ND) — INDICATES NOT DETECTED

[SS-101] — SOIL SAMPLE DESIGNATION–SOIL SAMPLE COLLECTED FROM SOIL GAS SAMPLING LOCATION OR COREHOLE IN CONCRETE FLOOR

OW-1 — TEST BORING / MONITORING WELL LOCATION

W-5 — PRODUCTION WELL

TOTAL VOC CONCENTRATIONS (PPM)

()=ND	ND<()≤2	2<()≤10	10<()≤20	20<()≤50	()≥50

NOTES:

1) THE YARD FEATURES WERE BASED UPON A PLAN ENTITLED, "BLOW UP OF NEW FACILITIES", SHEET 4 OF 7, PREPARED BY PEDRO PANZARDI & ASSOCIATES OF MAYAQUEZ, PUERTO RICO, DATED 1/20/89, ORIGINAL SCALE: 1:300.

2) THE INTERIOR BUILDING LAYOUT, ROOM NAMES AND INDIVIDUAL ROOM OR YARD DETAILS ARE BASED UPON COMPUTER-GENERATED DRAWING FILES PROVIDED BY DIGITAL EQUIPMENT CORPORATION OF SAN GERMAN, PUERTO RICO. THE ITEMS SHOWN ON THE INDIVIDUAL ROOM OR YARD DETAIL AREA PLANS WERE NOT MODIFIED BY GZA. NOTES OR ADDITIONAL DETAIL INFORMATION WAS ADDED BY GZA TO CLARIFY ITEMS OR NAMES SHOWN.

3) SOIL GAS SURVEY WAS COMPLETED ON 8/29/92 THROUGH 9/1/92 FOR SG-1 THROUGH SGI-30 (PHASE I). SOIL GAS SURVEY WAS COMPLETED ON 4/14/93 THROUGH 4/16/93 FOR SG-101 THROUGH SG-144 (PHASE II).

4) SOIL GAS SAMPLES WERE ANALYZED ON SITE USING A HNU MODEL 311 GAS CHROMATOGRAPH.

5) SOIL GAS CONCENTRATIONS ARE GIVEN IN PARTS PER MILLION (PPM) MEASURED ON A VOLUMETRIC BASIS.

6) EXTERIOR SOIL GAS SAMPLING LOCATIONS WERE TAPE MEASURED FROM EXISTING SITE FEATURES. INTERIOR SOIL GAS SAMPLING LOCATIONS WERE ESTIMATED BY LINE-OF-SITE OBSERVATIONS FROM INTERIOR WALLS.

APPROXIMATE LOCATION 200' WESTERLY

W-7 W-6

LOADING DOCK AREA

THE ONLY AREA CONFIRMED THROUGH SITE-WIDE FACILITY INVESTIGATIONS TO BE AN ON-GOING SOURCE OF CHLORINATED ETHENES TO THE GROUNDWATER.

- PRELIMINARILY IDENTIFIED THROUGH SOIL GAS SURVEY.
- FOLLOW-UP FIELD SCREENING OF SOIL SAMPLES FROM SOIL BORINGS (B-413, B-414, OW-408) SUGGEST ELEVATED VOC CONCENTRATIONS IN VADOSE ZONE SOILS.
- LABORATORY TESTING OF SOIL BORING SAMPLES CONFIRMS THE PRESENCE OF CHLORINATED ETHENES IN THE VADOSE ZONE AT CONCENTRATIONS UP TO 919 MILLIGRAMS PER KILOGRAM (MG/KG) WITH 870 MG/KG TRICHLOROETHENE.
- HIGHEST VOC CONCENTRATIONS DETECTED AT A DEPTH OF 4 TO 6 FEET IN B-414 AND 8 TO 10 FEET IN B-413 AS COMPARED TO A WATER TABLE DEPTH OF ABOUT 24 TO 30 FEET BELOW GROUND SURFACE.
- SEE GZA'S AUGUST 1993 PHASE II HYDROGEOLOGIC EVALUATION REPORT FOR ADDITIONAL DETAILS.

FILE INFO: C:\JOBS\20876.8\SHEET6.DWG 7/27/95

NOT TO SCALE

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SCALE : NTS
DATE : JULY 95

RCRA FACILITY INVESTIGATION SUMMARY REPORT
FORMER DIGITAL EQUIPMENT CORPORATION
SAN GERMAN, PUERTO RICO

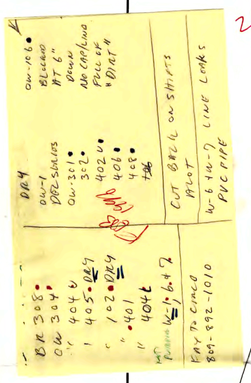
SOIL GAS SURVEY
TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS

PROJECT No.: 20876.8
FIGURE No.: 6

= SHOWS BE SAMPLED

X DRY 2/27/96

2/96 SAMPLING ROUND



WELL LOCATION	DATE TESTED	VOC Concentration (ug/l)			
		TCE	Cis 1,2,DCE	Other	Total
OW-1	Feb-93	<2	<2	ND	ND
OW-2	Sep-92 Feb-93	8 13	5 6	5 7	18 26
OW-101	Nov-94	4,857	75	340	5,272
OW-102	Sep-92 Feb-93	14 130	<2 6	10 14	24 150
OW-103	Sep-92 Feb-93	14 18	18 24	6 10	38 52
OW-105	Sep-92 Feb-93	16 <2	7 <2	13 ND	36 ND
OW-106	Sep-92 Feb-93 Nov-94	4 10 <5	8 22 21	2 7 0	14 39 21
DEC-201	Sep-92 Feb-93	<20 <20	310 250	220 200	530 450
DEC-202	Feb-93	5	37	326	368
DEC-203	Sep-92 Feb-93	60 30	<2 <2	242 510	302 540
DEC-204	Sep-92 Feb-93	99 22	9 <2	292 85	400 107
DEC-205	Sep-92 Feb-93	8 4	<2 <2	54 266	62 270
OW-301	Sep-92 Feb-93 Nov-94	<2 <2 <5	<2 <2 <5	ND ND 295	ND ND 295
OW-302	Sep-92 Feb-93	49 50	7 45	4 3	60 98
OW-303A	Sep-92 Feb-93 Nov-94	5 7 <5	8 4 14	ND 5 0	13 16 14
OW-304	Sep-92 Feb-93 Nov-94	19,000 40,000 11,500	300 1,000 <5	200 0 740	19,500 41,000 12,240
OW-305	Sep-92 Feb-93 Nov-94	3,800 4,000 139	2,900 2,400 <5	500 0 193	7,200 6,400 332
OW-307	Sep-92 Feb-93 Nov-94	120 190 320	110 130 <5	53 0 1,198	283 320 1,518
BR-308	Sep-92 Feb-93 Nov-94	86 230 109	74 130 <5	33 0 555	193 360 664
OW-401	Feb-93 Nov-94	190 118	110 <5	0 187	300 305
OW-402L	Feb-93	310	60	30	400
OW-402U	Feb-93	230	100	0	330
OW-403	Feb-93 Nov-94	710 <5	60 <5	0 ND	770 ND
OW-404L	Feb-93	160	180	0	340
OW-404U	Nov-94	<5	<5	ND	ND
OW-405	Feb-93	60	<2	0	60
OW-406	Nov-94	<5	15	0	15
OW-407	Feb-93	<2	<2	ND	ND
OW-408	Feb-93	770	170	20	960
W-1	Sep-92 Feb-93	22 12	8 5	6 5	36 22
W-3	Sep-92 Feb-93 Nov-94	<2 <2 <5	<2 <2 <5	ND ND 198	ND ND 198
W-4	Feb-93 Nov-94	<2 <5	<2 19	ND 0	ND 19
W-5	Sep-92 Feb-93 Nov-94	3 <2 <5	<2 <2 15	127 30 255	130 30 270
W-6	Sep-92 Feb-93 Nov-94	160 150 42	77 84 13	14 10 340	251 244 395
W-7	Sep-92 Feb-93 Nov-94	10 29 <5	4 11 838	ND 0 0	14 40 838

TABLE NOTES:
TCE = Trichloroethene
Cis 1,2, DCE = Cis 1,2-dichloroethene
Other = Other chlorinated VOC's
Total = Total chlorinated VOC's
"<" = indicates compound not detected (ND) value given is the method detection limit.

LEGEND

- W-5 — BEDROCK PRODUCTION WELL LOCATION AND DESIGNATION
- OW-405 — MONITORING WELL LOCATION AND DESIGNATION
- OW-1 — INDICATES VOCs NOT DETECTED (ALL 3 ROUNDS)
- NI — INDICATES WELL NOT INSTALLED AT TIME OF SAMPLING ROUNDS
- ND — INDICATES VOCs NOT DETECTED
- NS — INDICATES NO SAMPLE TAKEN
- DRY — INDICATES WELL DRY UPON SAMPLING
- 1.20 — TOTAL CHLORINATED VOCs mg/l
- OTHER CHLORINATED VOCs
- Cis,1,2–DICHLOROETHENE (DCE)
- TRICHLOROETHENE (TCE)
- III — GROUNDWATER MONITORING ROUND NUMBER
  - I SAMPLES COLLECTED SEPTEMBER 3 AND 4, 1992
  - II SAMPLES COLLECTED FEBRUARY 19, 22 AND 23, 1993
  - III SAMPLES COLLECTED NOVEMBER 28, 29 AND 30, 1994

NOTES

1) ROUND I AN II SAMPLES WERE ANALYZED BY EASTERN ANALYTICAL, INC. OF CONCORD, NEW HAMPSHIRE USING EPA METHOD 8240.

2) ROUND III SAMPLES WERE ANALYZED BY BECKTON ENVIRONMENTAL LABORATORIES, INC. OF PONCE, PUERTO RICO USING EPA METHOD 8010/8020.

MAGNETIC

PAVED PARKING

DATE	BY	DESCRIPTION	REV#

GRAPHIC SCALE 50' 0' 100' 200'

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SCALE : 1"=50'
DATE : JULY 95

RCRA FACILITY INVESTIGATION SUMMARY REPORT
FORMER DIGITAL EQUIPMENT CORPORATION
SAN GERMAN, PUERTO RICO

SITE PLAN SHOWING DISTRIBUTION OF CHLORINATED VOLATILE ORGANIC COMPOUNDS

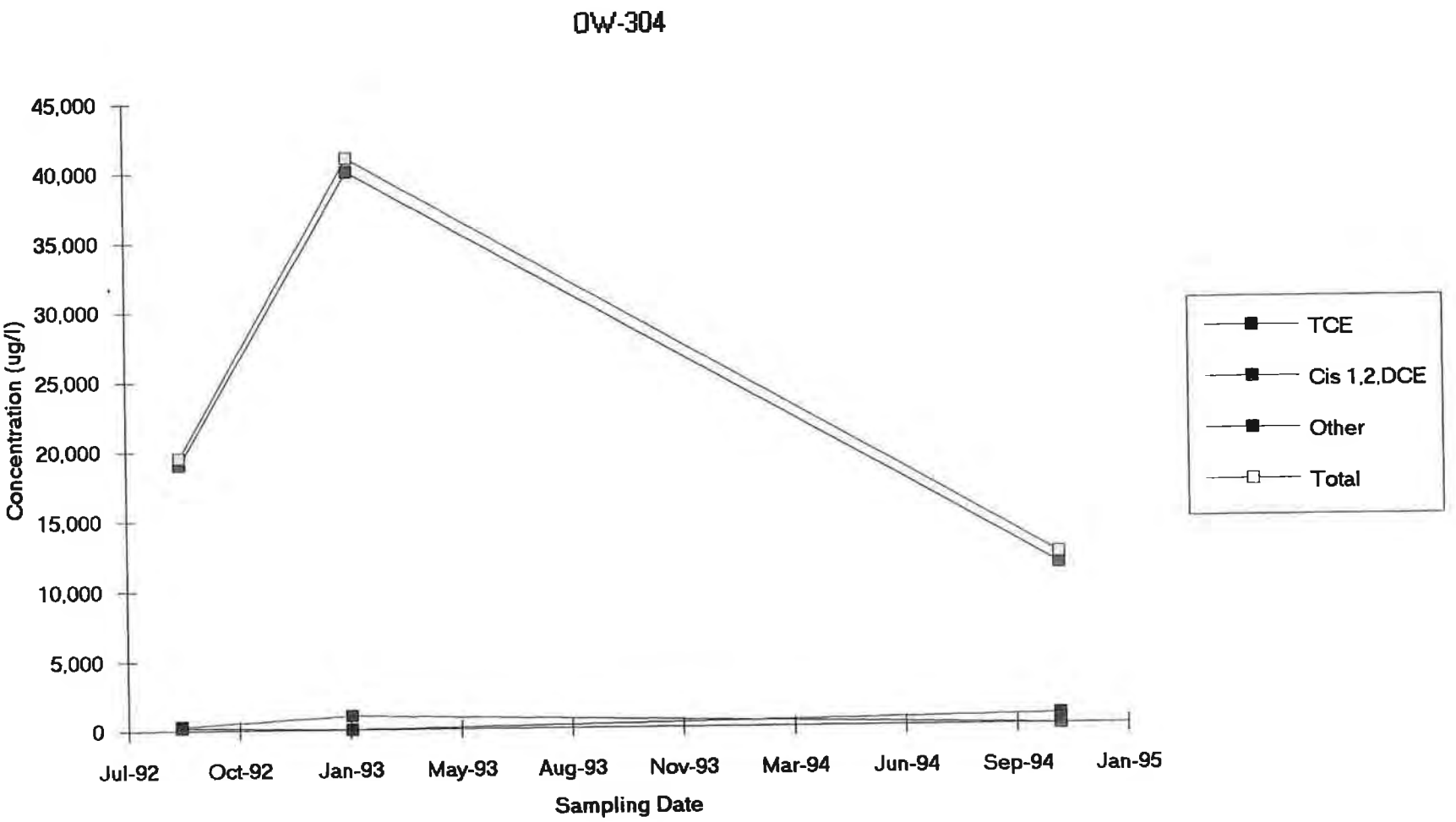
PROJECT No.: 20876.8

SHEET No.: 7

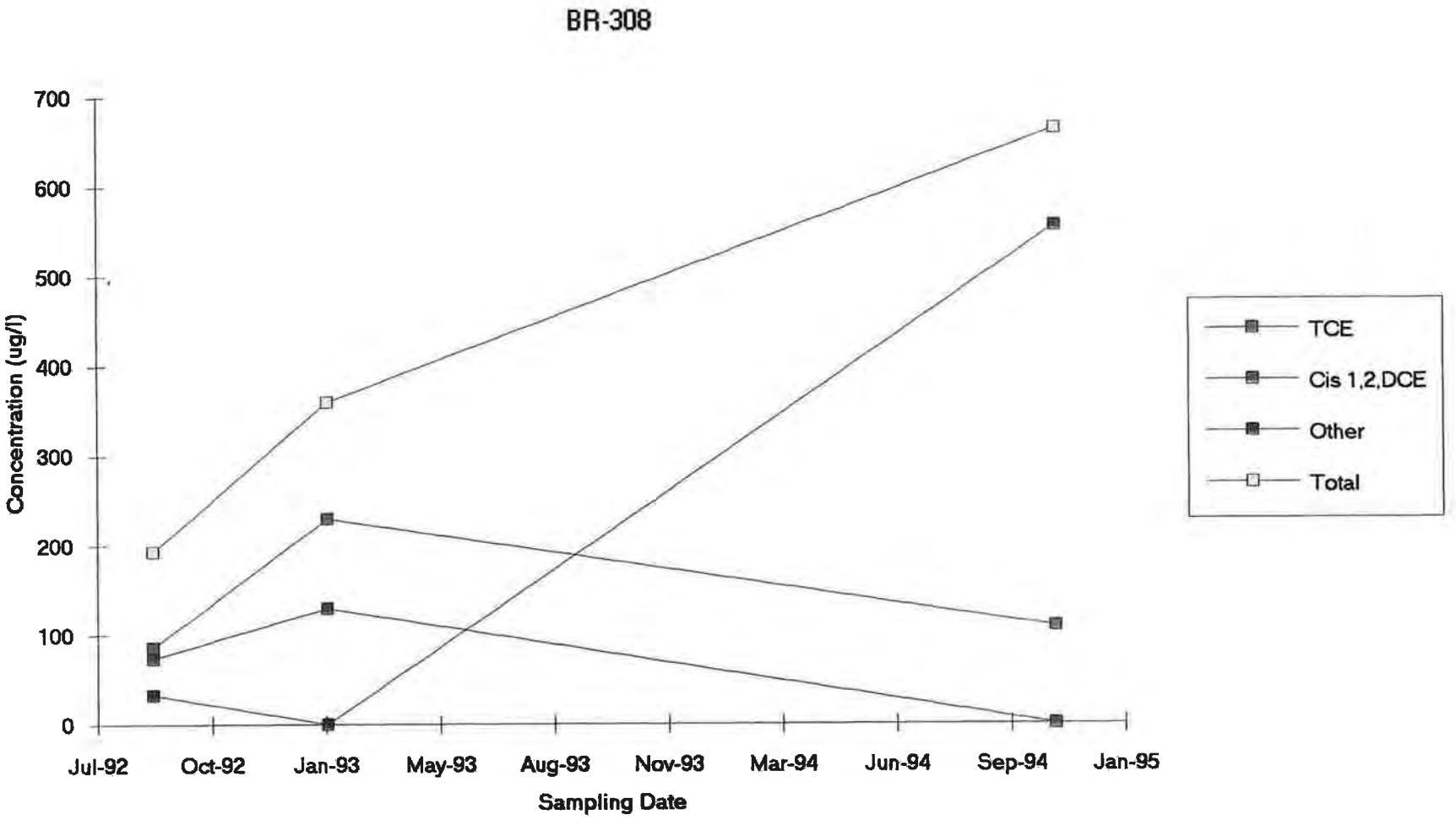
APPENDIX A

TIME-SERIES PLOTS

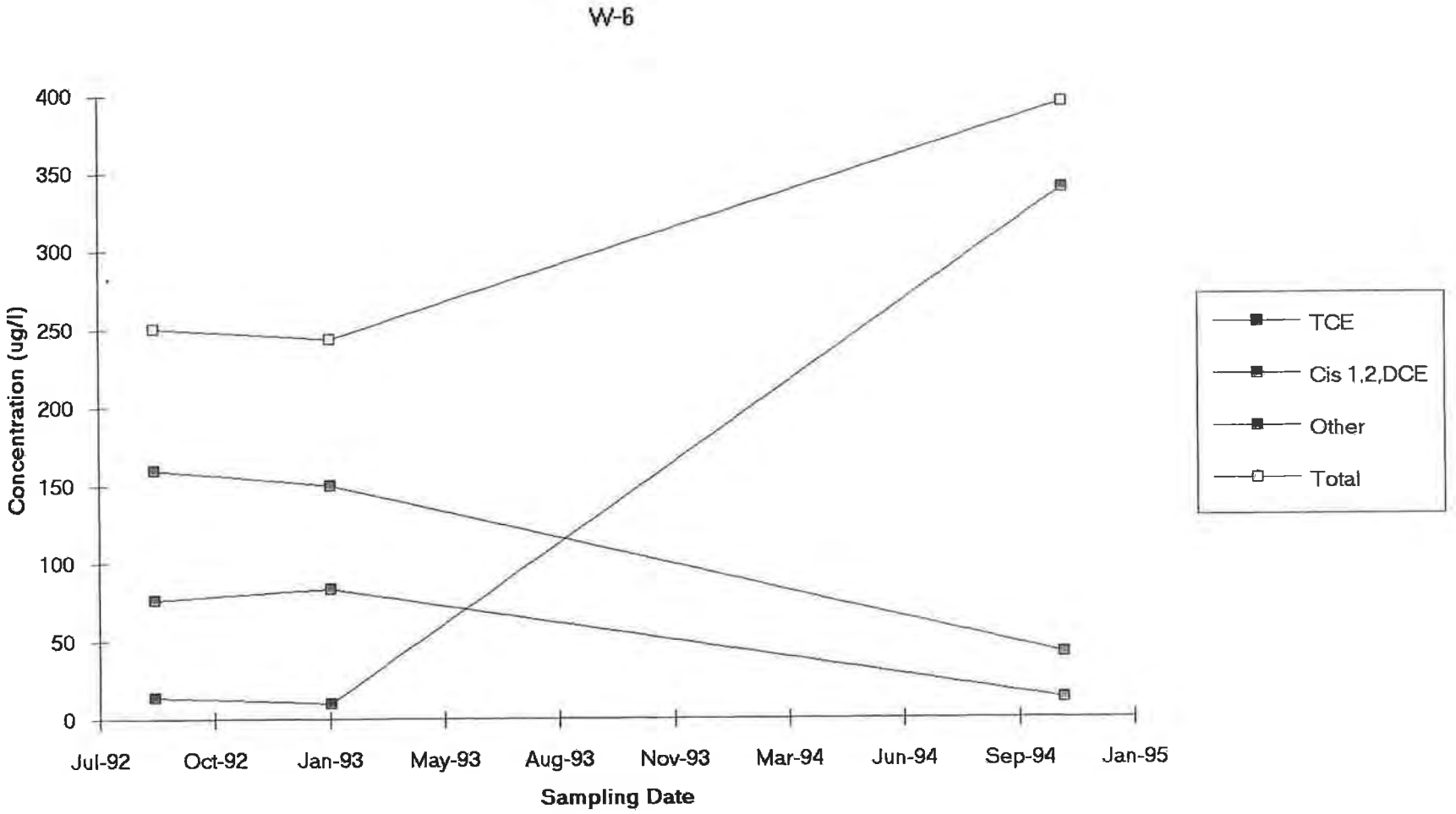
GROUNDWATER MONITORING DATA
FORMER DIGITAL EQUIPMENT CORPORATION
SAN GERMAN, PUERTO RICO



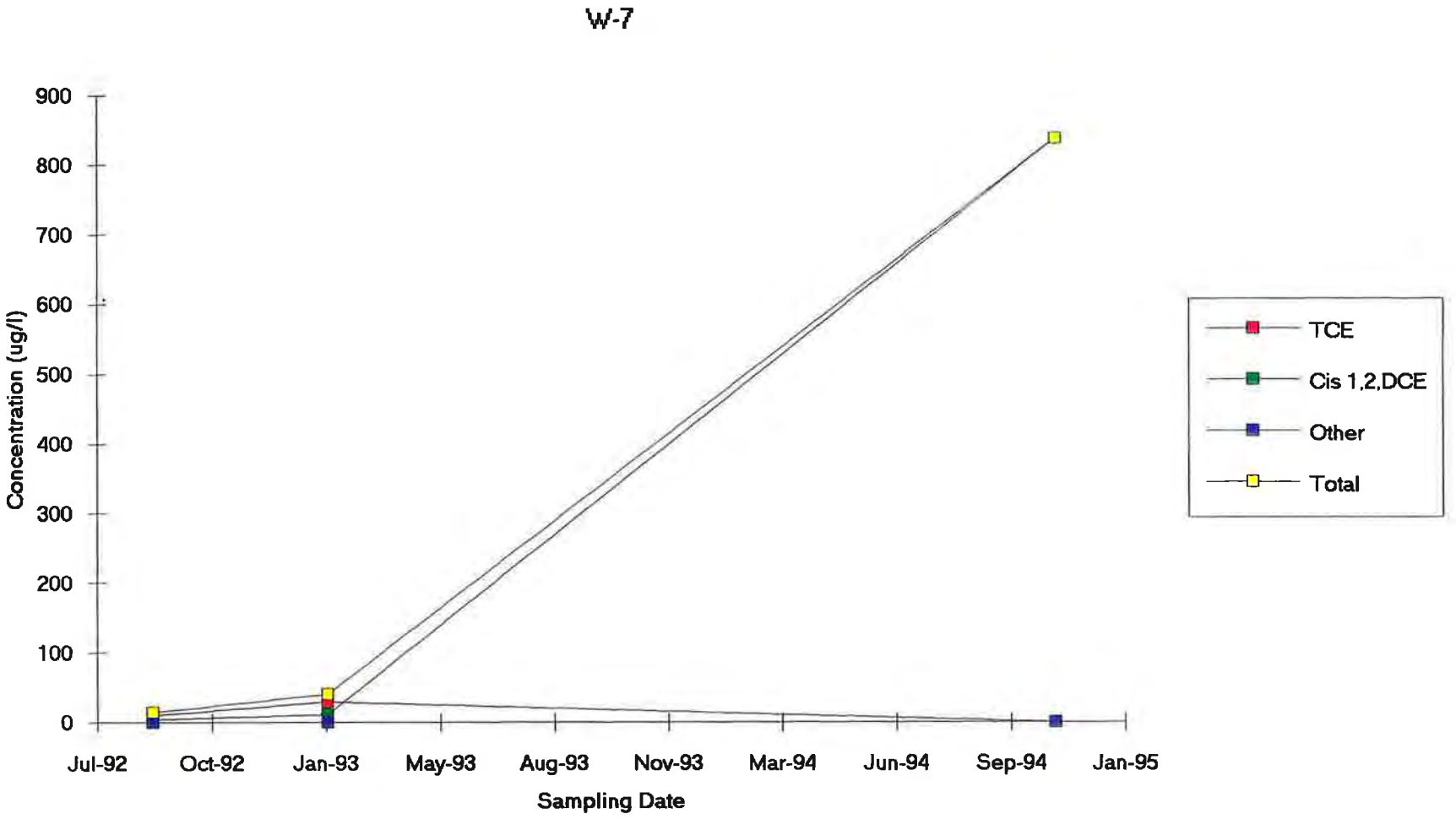
GROUNDWATER MONITORING DATA
FORMER DIGITAL EQUIPMENT CORPORATION
SAN GERMAN, PUERTO RICO



GROUNDWATER MONITORING DATA
FORMER DIGITAL EQUIPMENT CORPORATION
SAN GERMAN, PUERTO RICO



GROUNDWATER MONITORING DATA
FORMER DIGITAL EQUIPMENT CORPORATION
SAN GERMAN, PUERTO RICO



APPENDIX B

LIMITATIONS

APPENDIX B

LIMITATIONS

1. The conclusions and recommendations submitted in this report are based in part upon the data obtained from a limited number of soil samples from widely spaced subsurface explorations. The nature and extent of variations between these explorations may not become evident until further investigation. If variations or other latent conditions then appear evident, it will be necessary to reevaluate the recommendations of this Report.

2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the boring logs.

3. Water level readings have been made in the test pits, borings and/or observation wells at times and under conditions stated on the exploration logs. These data have been reviewed and interpretations have been made in the text of this Report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall and other factors different from those prevailing at the time measurements were made.

4. Except as noted within the text of the Report, no quantitative laboratory testing was performed as part of the site assessment. Where such analyses have been conducted by an outside laboratory, GZA has relied upon the data provided, and has not conducted an independent evaluation of the reliability of these data.

5. The conclusions and recommendations contained in this Report are based in part upon various types of chemical data and are contingent upon their validity. These data have been reviewed and interpretations made in the Report. As indicated within the Report, some of these data are preliminary "screening" level data, and should be confirmed with quantitative analyses if more specific information is necessary. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time, and other factors. Should additional chemical data become available in the future, these data should be reviewed by GZA, and the conclusions and recommendations presented herein modified accordingly.

6. Chemical analyses have been performed for specific parameters during the course of this study, as detailed in the text. It must be noted that additional constituents not searched for during the current study may be present in soil and groundwater at the site.

7. It is recommended that this firm be retained to provide further engineering services during design, implementation, and/or construction of any remedial measures, if necessary. This is to observe compliance with the concepts and recommendations contained herein and to allow design changes in the event that subsurface conditions differ from those anticipated.

8. In preparing this Report, GZA has relied on certain information provided by regulatory officials and other parties referenced therein, and on information contained in the files of state and/or local agencies available to GZA at the time of the work. Although there may have been some degree of overlap in the information provided by these various sources, GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this site evaluation.

9. The observations described in this Report were made under the conditions stated herein. The conclusions presented in the Report were based solely upon the services described, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by the Client.

10. In preparing this Report, GZA has relied on certain information provided by federal, state or local officials and other parties referenced herein, and on information contained in the files of federal, state, and/or local agencies available to GZA at the time of our compliance review. Although there may have been some degree of overlap in the information provided by these various sources, GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of the study.

11. Regulatory issues noted in this report have been evaluated based on our interpretation of regulations and interpretations provided by regulatory agency and Circo Caribe personnel. In some cases, these interpretations require subjective judgment, and we cannot guarantee that all regulatory agency personnel will interpret the regulations in the same manner as we have, or in the manner that the agency personnel we spoke to have. Governmental agencies' interpretations, requirements, and enforcement policies vary from district office to district office, from state to state, and between federal and state agencies. In addition, statutes, rules, standards, and regulations may be legislatively changed and inter-agency and intra-agency policies may be changed from present practices from time to time.